Chunks in L2 Development
A Usage-based Perspective

Hana Smiskova-Gustafsson

university of groningen

faculty of arts

CLCG

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Promotor	:	Prof. dr. C.L.J. de Bot
Copromotor	:	Dr. M.H. Verspoor
Beoordelingscommissie	:	Prof. dr. N.C. Ellis
		Prof. dr. P. Hendriks
		Prof. dr. A. Housen

Not everything that can be counted counts,
and not everything that counts can be counted.

Albert Einstein

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Preface and Acknowledgments

As an eternal learner of languages, I am very aware of the struggle of identifying, learning, and successfully using just the right expression for the message, the context, and the hearer. I think it is fair to say that most language learners strive for native-like language use (whatever *native-like* may mean for them), and that most language learners feel there is something between traditional grammar and vocabulary that is both very crucial and very elusive. For all these reasons, I find the research field on chunks in its many facets fascinating - from different theoretical approaches and methods to more or less applied research strands.

I would like to thank a number of people for their support and inspiration, as without them, this dissertation would never have come into existence.

First of all, my thanks must go to Kees de Bot and Marjolijn Verspoor, who gave me the chance to pursue a PhD at the Department of Applied Linguistics, University of Groningen; who supervised my research for more than four years and provided all kinds of crucial support – institutional, academic, and personal. The D-word (or rather the D-chunk?) must be mentioned here: together with Wander Lowie, Kees and Marjolijn have introduced me to DST (Dynamic Systems Theory), which is surely a breakpoint for all students of Applied Linguistics in Groningen, undergraduate and graduate alike. But what I value most of all is the trust Kees and Marjolijn have had in my abilities and the freedom they have given me to explore new ideas and find my footing as an independent researcher. I feel very lucky and very grateful to have been afforded this freedom.

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And of course I must also thank my family: my parents, Mirek and Alexandra, and my sisters, Lenka and Ivana, for their endless love and support throughout my years in Groningen. I often remember my father's sister, Jarmila (who is sadly no longer with us), who used to say to me: "On the grade scale of 1 to 5[1] you could have zeros if only you wanted to!" This dissertation surely must count as such an achievement. I can only hope that my aunt can see that from where she is now.

But my greatest thanks must go to Ulf, my husband. Throughout the journey towards the completion of this work Ulf has been the most wonderful companion one could wish for, in the best and in the worst of times. And so to conclude this section, I cannot help but quote Ulf on one of his endearing statements (the phrasing of which made me laugh out loud):
"Well, people supported you, and stuff, but the work is your own."

[1] Czech grade scale used in primary and secondary education; 1=excellent, 5=fail.

Chapter 1
Introduction

This dissertation started as part of the OTTO project (Onderzoek Tweetalig Onderwijs[2]), a large-scale investigation into the effectiveness of bilingual secondary education in the Netherlands. Apart from regular instructional streams, where English is taught as a subject, Dutch secondary education also offers bilingual instructional streams (Tweetalig Onderwijs, TTO), where English is primarily taught through content subjects such as history and geography. Students enrolled in regular streams receive two hours of English instruction per week, while students enrolled in bilingual streams receive in addition to regular English instruction more than half their content subject classes in English. The Dutch regular stream can therefore be seen as a traditional foreign language instruction setting, which in general does not offer much L2 input; while the bilingual stream can be described as a semi-immersion setting, in which language learners are exposed to a great deal of L2 input. Dutch bilingual education is generally seen as effective since learners in semi-immersion instructional settings (in this study referred to as *high-input learners*) seem to learn English better and faster than learners in regular instructional settings (in this study referred to as *low-input learners*). The aim of the OTTO project was to capture the specific ways in which the semi-immersion setting may be more effective than the regular setting. The project involved the collection of large amounts of learner data, both linguistic (e.g., written task-elicited texts and various linguistic data collected through language tests) and non-linguistic (learner background data, such as motivation, previous knowledge of English, out-of-class exposure to English) from approximately 600 high- and low-input learners from 7 different schools in the Netherlands.

[2] The OTTO project was carried out by the Department of Applied Linguistics at the University of Groningen between 2007 and 2010; it was funded by the Dutch Ministry of Education, Culture and Science, the European Platform, and the Network of TTO Schools in the Netherlands.

One of the main questions addressed by the OTTO project was in what ways high-input learners achieve greater proficiency in L2 English than low-input learners. From a usage-based perspective where input is one of the main drivers of language learning it is reasonable to expect that over time the high-input learners' English will show greater improvement in a number of aspects than low-input learners English. For instance, we can expect that the high-input learners will become more varied, complex, and accurate in terms of grammatical structures, that their vocabulary will become broader and more accurate. The findings of the OTTO project confirmed these expectations: high-input learners indeed achieved greater complexity and accuracy in their English than low-input learners. However, the OTTO project also showed that the main reason high-input learners are more proficient in English than low-input learners is that high-input learners generally sound more authentic (Verspoor et al., 2010, p. 62). In addition, the OTTO project showed that one of the best discriminators between learners of different L2 proficiency is the use of *chunks* (Verspoor, Schmid, & Xu, 2012).

Chunks are indeed an important aspect of authentic, native-like language use. Research across disciplines has convincingly demonstrated that chunks (also referred to as multiword expressions, formulaic sequences, or prefabs) are a characteristic feature of native speaker spoken and written repertoire (Nattinger & DeCarrico, 1992; Wray, 2002; Schmitt & Carter, 2004; Sinclair, 1991). Chunks are often a distinguishing factor between native and non-native speakers (Pawley & Syder, 1983), between natural, idiomatic ways of expression and what may be rather awkward-sounding (though grammatically correct) use of language. Native-like chunks not only help L2 learners sound fluent, accurate and authentic, they also have the potential to speed up linguistic development (Eyckmans, Boers, & Stengers, 2007; Pawley & Syder, 1983). Clearly, when tracing the acquisition of L2 in relation to native-like norms, chunks are a highly relevant developmental variable.

Apart from their pervasiveness in native speaker language, chunks are also relevant for usage-based accounts of language structure and language learning. Certain features of chunks such as nesting (Hoey, 2005) and chunking at different levels of L2 system organization are compatible with the notion of language as a complex adaptive system (Beckner et al., 2009); and what is known about the acquisition of chunks is in line with usage-based accounts of L2 development. Usage-based accounts hold that language learning is exemplar-driven: through frequent encounters (usage-based events) we save

exemplars of utterances (tokens), some of which may later serve for analysis into abstract constructions, which can be used productively. We store exemplar utterances by mapping meaning onto form and function, regardless of their length. This means that the "unit of acquisition" can be anything within the range of single words up to whole sentences, and is strongly determined by contextual, communicative needs (Tomasello, 2003; Hopper, 1998). This process seems to be reflected in the wide variety of overlapping types of chunks in native-speaker corpora.

So as learners increase their L2 proficiency towards a native-like level they need to acquire a vast number of chunks. From a usage-based perspective, frequency of forms in input is a major driver of language acquisition, so L2 learners with sufficient exposure to authentic input will acquire chunks just as they acquire other aspects of language. However, for L2 learners the acquisition and use of native-like chunks may not be an easy task for a number of reasons. Firstly, most L2 learners do not have enough exposure to authentic input. Next, L2 learners tend to focus on individual words as meaning units rather than on multi-word chunks, perhaps as a result of classroom instruction, which tends to encourage separate attention to grammar and vocabulary. Some chunks may not be sufficiently frequent or salient for the L2 learner: apart from a range of clearly fixed expressions (e.g. *of course; living room; grow up; the sky is the limit;*) there are also simply "preferred ways of saying things" (Granger & Paquot, 2008) which are seemingly not fixed at all and for an L2 learner may be hard to spot as a chunk (compare *Will you marry me?* and *Would you like to become my spouse?* Pawley & Syder, 1983). Chunks may also be difficult to remember and recall because they are too long. Finally, the learning of chunks in a foreign language may also be influenced by the learners' mother tongue. As a result, L2 learners may use correct grammar and vocabulary but express themselves in awkward ways because they are not using enough chunks, or because they are using chunks incorrectly.

Taking a usage-based perspective, this dissertation investigates the use of chunks in written texts collected as part of the OTTO project from Dutch L2 learners of English enrolled in bilingual (high-input) and regular (low-input) streams of Dutch secondary education. The main aim is to capture important aspects of chunk use in written learner texts, especially in relation to the learners' high- and low-input conditions. Most of the learner texts are at lower levels of L2 English proficiency (CEFR A1 – B2) and show a great deal of L1

Dutch influence; also, there are considerable individual differences in the use of chunks. Moreover, previous studies of chunks in L2 learner language have been carried out primarily with university students and/or within the academic genre, so research into chunks in teenage L2 learner language has not yet been sufficiently established. As a result, for the purposes of this dissertation the research questions and methods traditionally employed in studies of chunks are only useful to a certain extent. Therefore, the dissertation takes a data-driven, dynamic, and holistic approach, which helps identify relevant research questions and methods for the study of chunk development in written L2 learner language from a usage-based perspective.

The dissertation is a collection of four self-contained articles in various stages of publication complemented with a Theoretical Background section (Chapter 2), and Conclusions (Chapter 7). Each article reports on an original study of different aspects of chunks in L2 development in the OTTO learner population, but the four studies are related, each building in some way on the findings of a previous one. The first study (Chapter 3; Smiskova & Verspoor, in press) maps out chunk use in a selected sample of the OTTO learner population, with a view to capturing potential differences in chunk development between high- and low-input learners. The study identifies important questions for further study of chunks in L2 development and so provides a point of departure for the other studies in this dissertation. The second study (Chapter 4; Verspoor & Smiskova, 2012) focuses on dynamic aspects of chunk development in the same sample population. Taking a dynamic perspective, the study shows crucial differences in developmental trajectories between a high- and a low-input learner. In the first two studies, it was found that the chunk type that best distinguishes between high- and low-input learners is "conventionalized or preferred ways of saying things". The third study (Chapter 5; Smiskova, Verspoor, & Lowie, 2012) zooms in on these. Taking a Cognitive Linguistics approach, the study aims to define and operationalize "conventionalized ways of saying things", CWOSTs, so they can be further studied in L2 development. The fourth and final study (Chapter 6; Smiskova-Gustafsson, under review) takes a cognitive-constructionist perspective and investigates the development of CWOSTs by examining the role of entrenched L1 constructions and L2 frequency in how L2 learners initially establish CWOSTs as form-meaning mappings.

Chapter 2
Theoretical Background

The research field on chunks is broad with many different perspectives and definitions. For the purposes of this dissertation I will focus on the use of native-like chunks in written L2 learner texts. The first part of this chapter describes the role of chunks in native speaker repertoire, the acquisition and use of chunks by L2 learners, and established approaches to the definition and identification of chunks in written texts. The second part of the chapter anchors chunks in a theoretical framework: a dynamic usage-based approach. I describe its perspective on language structure and language development, and its implications for the study of chunks in written L2 data. Finally, the chapter foreshadows the research questions addressed by the individual studies presented in this dissertation.

2.1. Chunks in native speaker repertoire

In their much quoted article based on conversational analysis, Pawley and Syder (1983) discuss "two puzzles for linguistic theory", that of *native-like selection* and *native-like fluency*. Unlike most L2 learners, native speakers seem to share knowledge of how words go together in that they are able to select the right combination of words to express a certain notion, ranging from fixed, simple collocations (such as *to* [hour] and *past* [hour] when telling the time) to more variable sentence frames (*Come to think of it,…*) and whole conventionalized sentences (*I see what you mean.*). At the same time, native speakers are capable of producing "fluent stretches of spontaneous connected

discourse" (Pawley & Syder, 1983, p. 191), which seem to exceed the limits of human processing capacities for creating novel speech.

The observation that native speakers do not combine words randomly has been repeatedly confirmed by extensive analyses of native speaker corpora. The most groundbreaking was the Cobuild project, a large lexicographic analysis of the English language using a frequency-based, distributional approach. On the basis of this analysis, Sinclair (1991) concluded that there are two different modes of handling linguistic material: the Open Choice Principle allows us to build up novel utterances with the help of grammar rules and individual words, while the Idiom Principle allows the selection of a sequence of two or more words on the basis of their previous and regular occurrence together (Sinclair, 1991, p. 23). Sinclair argued that speakers switch from one to the other mode depending on the demands of the communicative situation, and that the majority of text can be interpreted through the Idiom Principle as prefabricated, formulaic word sequences. The exact proportion of formulaic word sequences / chunks in a native speaker text is still subject to discussion - such estimates depend on what one defines as a chunk. However, analyses of native speaker corpora have provided enough evidence to show that prefabricated language / chunks may account for up to a half of native speaker text (Erman & Warren, 2000); the proportion may be even higher in spoken language (Ellis 2008a, p. 5).

The pervasiveness of chunks in native speaker repertoire has been attributed to two factors. Firstly, the use of chunks has processing advantages: since the speaker is able to retrieve word sequences as a whole or as automatic chains from long-term memory rather than create them with the help of grammar rules, he/she saves on processing requirements and is able to produce fluent multi-clause utterances (Pawley & Syder, 1984; Ellis, 2001). The use of chunks therefore makes the communication between a speaker and a hearer highly efficient by minimizing demands on the processing of linguistic input and output. Secondly, as Wray (2002) argues, chunks serve to promote language users' own interests: by employing chunks that are commonly used in one's community the language users are able to align themselves socially with other speakers, show their adherence to the speech community, and fulfill their communicative needs while minimizing misunderstanding (Wray, 2002, 2012). The wide variety of chunks in native speaker repertoire and the accounts of their presence have served as a benchmark and reference for research on chunks in L2 learners.

2.2. Acquisition and use of chunks by L2 learners

Since chunks are so pervasive in native-like repertoire, they are a crucial part of learning an L2. In relation to native-like selection Pawley and Syder (1983) concluded that the language learner`s task is not only to master the generative rules of a language to be able to produce grammatically correct sentences, but also to acquire the knowledge of "which of the well-formed sentences are native-like" (Pawley & Syder, 1983, p. 194). Since then, the importance of native-like naturalness and the importance of using chunks to achieve naturalness have been recognized by a number of researchers across research disciplines:

> …turns of phrase commonly used by native speakers, as opposed to grammatical sentences, which a native speaker would not normally use (Wray, 2002, p. 287, note 9)
>
> Native-like selection is not a matter of syntactic rule alone. Speaking natively is speaking idiomatically, using frequent and familiar collocations (Ellis, 2001)
>
> …the idiomatic way to talk about something in a particular context… Wray (2002, p. 209)
>
> …a combination of at least two words favored by native speakers in preference to an alternative combination which could have been equivalent had there been no conventionalization. (Erman & Warren, 2000)
>
> …more predictable sequences of words than regular constructions (Nattinger & DeCarrico, 1992)

However, most L2 learners have difficulty achieving native-like use of chunks and as a result sound foreign and unidiomatic (Pawley & Syder, 1983; Wray, 2002; Ellis, Simpson-Vlach, & Maynard, 2008). The issue is not whether L2 learners use chunks at all: according to Hoey (2005, p. 5) the majority of meaningful sentences are impossible to build without some use of fixed word

combinations. Rather, the question is how L2 learners' use of chunks compares to that of a native or near-native user of the language.

Generally speaking, research has shown that learners in different settings and of different levels of L2 proficiency tend to use chunks differently (Ellis, Simpson-Vlach, & Maynard, 2008, p. 378). Verspoor, Schmid, & Xu (2012) found that chunks are one of the strongest discriminators between lower and higher levels of L2 English proficiency. Beginning learners generally rely on chunks to achieve functional communication, but when their other linguistic resources develop, chunks tend to lag behind (Wray, 2002, p. 177). Advanced learners do use chunks but not to the same extent as natives and not the same type of chunks: Hinkel (2002) found that L2 learners' texts had fewer collocations than L1 users' texts; Durrant and Schmitt (2009) found that L2 learners tend to overuse high-frequency collocations (such as *good example*) and underuse the less frequent but more strongly associated collocations (such as *bated breath*), which are typically used by native speakers. Also, even advanced L2 learners often use chunks erroneously: Yorio (1989) found that written English samples collected from advanced ESL learners' contained attempts at chunks, which were full of errors; similarly, Sonomura (1996) showed that L2 learners' texts had more collocation errors than L1 users' texts. Although research on L2 chunks is difficult to compare due to the variety of approaches and methods, there is general agreement that L2 learners' repertoire as compared to that of L1 users is characterized by either overuse, underuse, and/or misuse of native-like chunks (Paquot & Granger, 2012).

L2 learners' difficulty with chunks has been accounted for mainly by differences in storage and processing between L1 users and L2 learners. Wray (2002, pp. 206-213) suggests that in L1 acquisition, chunks are learnt as whole phrases and then stored and processed as whole units (holistically), while post-childhood L2 learners tend to analyze input for individual words. But even if they do recognize a formulaic sequence, L2 learners might store its component parts as separate lexical items. Ellis (2001) attributes the difficulties to the limited capacity of working memory. Assuming the role of working memory for chunks is the same as for individual words, chunks may be more difficult since they contain more phonological units. As a result, they are prone to loss of detail, since L2 learners rely on the memory of the visual and/or phonological shape of the whole unit. Unless chunks continue to be encountered, and are regularly used, the memory of them will fade. When trying to retrieve a chunk, the learner will then have to use his/her existing L2 system to reconstruct the

sequence, which is likely to produce errors (Wray, 2002). To accommodate these differences, Wray proposed separate lexicons for L1 acquisition and post-childhood classroom-taught L2. While in L1 acquisition chunks are stored directly and holistically, post-childhood, classroom taught L2 learners often arrive at chunks via the fusion of individual words.

There are other reasons for L2 learners' difficulties with chunks. Firstly, the size of the linguistic unit that L2 learners perceive as salient in input may be different from native speakers, since L2 learners seem to focus on individual L2 words as meaning units rather than on multi-word sequences (Wray, 2002). Eyckmans, Boers, & Stengers (2007) confirm this by showing that even when given the appropriate training, L2 learners have difficulty identifying chunks in a previously unseen text. This may be the result of classroom instruction, which often encourages separate attention to grammar rules and individual words (Wray, 2002, p. 6). Next, most L2 learners do not have sufficient exposure to authentic native-like input where chunks are pervasive; also, some chunks do not occur frequently enough to be encountered even in an authentic native-like repertoire (Bybee, 2008; Wray, 2002, p. 31). Finally, there are individual differences. Wray (2002) stresses that the term post-childhood or adult L2 learners refers to age-related differences caused by "a conglomeration of factors which affect the individual`s approach to learning" (p. 213). This suggests that the way in which individual learners perceive, process, store, and use chunks is to a certain extent due to individual differences, and will be different in different learners. Schmitt and Carter (2004) also describe considerable variation in L2 learners' use of chunks and conclude that this must be partly due to individual differences.

2.3. Capturing chunks in text

The question of what chunks are exactly is quite complex but in the context of this dissertation a very important one. To be able to study chunks in L2 development and to capture differences in the use of chunks, we need to be clear about what we understand by "a chunk" in general; moreover, we need to be able to distinguish between different chunk types. This will enable us to identify chunks in learner texts and tease out relevant aspects of chunk development.

2.3.1. Characteristic features of chunks

As a linguistic phenomenon (in terms of structural properties) chunks are rather fuzzy and notoriously difficult to define; also, chunks are represented by a wide range of different subtypes. Generally speaking, chunks are defined within the syntax-lexis interface (Gries, 2008, p. 8). Various aspects of chunks could be described in terms of phraseology, semantics, syntax, morphology, and discourse (Granger & Paquot, 2008). Chunks have been given a variety of labels by different authors, depending on their theoretical positions, research focus, and research purposes. To illustrate just how varied this research field is Wray (2002, p. 9) has compiled a list of about sixty different terms[3] referring to chunks of language at different structural and functional levels. Many of these terms overlap in scope or describe essentially the same type of chunk. Similarly, Granger & Paquot (2008) explore phraseological and distributional approaches to the identification and categorization of chunks in order to clarify the relations between different terms and research strands.

There have been numerous attempts to classify chunks into different subtypes. Depending on their theoretical background, research design and purpose, different authors and studies have selected and prioritized different defining features of chunks. This is also reflected in existing classifications or typologies of chunks (Moon, 1997; Nattinger & DeCarrico, 1992; Wray, 2002). Most classifications are based on one or more of the following criteria (Granger & Paquot, 2008; Gries, 2008):

> *Internal structure* (e.g. verb+noun; verb+preposition) of the sequence, which may or may not be regular. Some sequences have irregular syntax (such as *by and large*), while others are fully regular in structure (such as *Will you marry me?*). Structurally, a formulaic sequence may or may not fit predefined linguistic or structural categories, such as in the case of phrase fragments and lexical bundles: *the back of the; nothing to do with* (Biber, 2000).
>
> *Extent* (phrase- vs. sentence-level) describes the syntactic level of the sequence. Some sequences function below the level of the sentence, while others are complete sentences and (can) function as autonomous

[3] e.g.: multi-word units/items, prefabricated language (prefabs), chunks, phrasal lexemes, lexical phrases, lexical bundles, etc. (see Wray, 2002, p. 9)

utterances (such as *Will you marry me?*). This feature is not entirely clear-cut, as more complex chunks may be nested, i.e., they may consist of several simpler sequences (Hoey, 2005; Wray, 2002; Biber, 2000).

Degree of semantic (non-)compositionality refers to the meaning of a word sequence and describes the degree to which it is idiomatic. Many word sequences are not semantically transparent, that is, their meaning cannot be interpreted on the basis of the meaning of their individual components or read as a literal statement. Fossilized pure idioms (such as *to kick the bucket*; *by and large*) are an example of non-compositional, highly idiomatic sequences, while other conventionalized sequences are fully compositional and transparent (such as *Will you marry me?*). In terms of (non-) compositionality, chunks form a continuum, from semantically opaque to semantically transparent (Granger & Paquot, 2008; Wulff, 2008; Gries, 2008).

Degree of syntactic flexibility and collocability refers to the fixedness and institutionalization of a word sequence. It describes the degree to which a sequence is variable (open slots), and the degree to which its components occur together in the language of a speech community. Chunks are perceived as part of a continuum at one end of which there are fully fixed expressions and on the other completely free, conventionalized word combinations. At various other points of the continuum lie expressions that may consist of fixed sequences as well as (partly) memorized lexical and structural material (Granger & Paquot, 2008; Nattinger & DeCarrico, 1992; Wray, 2002).

Discourse function refers to the pragmatic function of a formulaic sequence. Some chunks have a referential function (e.g., lexical collocations such as *strong coffee*) while others exhibit specific discourse and organizational functions (discourse organizers, linking expressions, such as *to conclude; in other words;* Granger & Paquot, 2008).

An important feature of chunks in native-like repertoire is that they tend to overlap: shorter chunks can be incorporated within longer chunks (Wray, 2002, p. 28; Biber, 2000, p. 990) or flow into each other seamlessly, making it near impossible to separate the individual chunks. Hoey (2005, p. 5) refers to such

overlaps as nesting and demonstrates how collocations interlock to build up a whole natural-sounding sentence:

> *In winter Hammerfest is a thirty-hour ride by bus from Oslo, though why anyone would want to go there in winter is a question worth considering.*
>
> *thirty hour ride by bus from*
> *[thirty hour [[ride][by bus]] from]]*
> chunks: *thirty hour ride, ride by bus, by bus, by bus from,* etc.
>
> though why anyone would want to go there
> [though [why] anyone would] [want to] go] there]
> chunks: *though why, why anyone would, why anyone would want to, want to go,* etc.

Similarly, Hopper (1998) talks about "several layers of regularity" (p. 168), which makes it difficult to distinguish between formulaic and non-formulaic word sequences; even suggesting that individual words characteristic of a specific jargon are, in a sense, formulaic (e.g. *normal* and *disturbed* in a health care professional jargon).

To sum up, chunks are difficult to capture as linguistic units because they lie at the interface of traditionally defined language modules (grammar, lexis, morphology, discourse). Some characteristic features can be defined but those do not necessarily apply to all chunks, as some are prototypical examples of their categories, while others less so. Therefore, we will follow Wray (2002, p. 19), who points out that the definition and identification of chunks in texts is a cyclical process: in order to decide on what counts as a chunk in the data, one must first carry out a preliminary analysis of the data to see what chunk types may be characteristic of the text, and only then decide on a suitable definition and identification approach.

2.3.2. Methods of identification

Methods of identification of chunks in written texts are based on one or more characteristic features, which means that they usually prioritize certain types of chunks over others. Preliminary analysis of the data suggested that for the

purposes of this study established methods are in some way useful but also have certain shortcomings.

Phraseological approaches identify chunks (phrasemes) using phraseological criteria such as internal structure, semantic non-compositionality, and syntactic irregularity. They strictly separate phraseology from syntax; they also clearly distinguish between different types of chunks. For example, word sequences can be identified as idioms (*to spill the beans*), phrasal verbs (*blow up*), lexical collocations (*heavy rain*), grammatical collocations (*afraid of*), and proverbs (*When in Rome*) (Granger & Paquot, 2008). Preliminary analysis of the data showed that this approach is very useful because some of these chunk types may indeed be very frequent (e.g. grammatical collocations). However, while this approach will reliably identify traditionally recognized chunk types, it will not capture words sequences which are "fully regular, both syntactically and semantically, and yet clearly belong to the field of phraseology…they are simply preferred ways of saying things" (Granger & Paquot, 2008, p. 35). In other words, the types of chunks that lie towards the end of the continuum of defining features.

Frequency-distributional approaches see chunks as recurrent word combinations of different lengths (*n*-grams), which are then extracted from a corpus on the basis of frequency of occurrence and strength of mutual association (e.g., the MI score) with which certain units co-occur in a corpus. This may also include units with empty slots or categories, such as *get+verb-ed,* or *think nothing of –ing* (so called collostructions, Stefanowitsch & Gries, 2003). Word sequences will then be identified as chunks if they fit within specified thresholds. For instance, in order to identify academic formulas in texts, Ellis, Simpson-Vlach, & Maynard (2008, p. 380) establish three corpus-based criteria: *n*-gram length (3, 4, 5 words), frequency bands (high, medium, low; means 43.6, 15.0, 10.9 per million, respectively), and MI bands (high, medium, low; means 11.0, 6.7, 3.3, respectively). This approach is highly reliable in capturing frequent word combinations that fit these criteria. However, in relation to our data this would have a disadvantage: defining chunks only on the basis of such criteria may not help us paint a detailed picture of chunks in L2 development. For instance, a preliminary analysis of two learners' (one high- and one low-input) use of chunks over time showed only very few two-word collocations that fit these criteria, which did not allow much comparison of the two learners' use of chunks over time. So while no doubt reliable, this method failed to capture important differences between the two learners. Nevertheless, a

frequency-distributional approach may also be used to search reference corpora in order to establish whether a word combination used by a learner may be a native-like chunk. There are standardized corpora such as the BYU-BNC: The British National Corpus (Davies, 2004) or the COCA: Corpus of Contemporary American English (Davies, 2008), as well as other linguistically relevant search engines such as WebCorp, which is designed to use the World Wide Web as a corpus (Renouf, Kehoe, & Banerjee, 2007; Bergh, 2005). Moreover, seen from a usage-based perspective, a frequency-based approach may lend support to other identification methods, such as intuitive judgment.

Intuitive judgment of formulaicity may help capture chunk types that do not fit traditionally recognized categories. One of the main sources of intuitive judgments is the researcher him/herself, who then may choose to validate his/her intuition with the help of an independent panel of judges. However, the question of usefulness of intuition in identifying chunks is quite complex. Some researchers point out that human judgment about the usage of language does not always reflect the evidence provided by corpora; i.e., we do not always use language the way we think we do (Sinclair, 1991, p. 4). Ellis (2012, pp. 26-27) shows that judgment of formulaicity is tricky because different expressions may be approached differently depending on context, which can make intuitive judgments inconsistent. And indeed, researchers have reported much variation in native speaker intuition with regard to formulaic language (Wray, 2002, p. 28). At the same time, it can be argued that if one of the characteristics of formulaic sequences is that they are shared across a speech community, they should be easily identified as such by the speakers of the language. Perhaps the difficulty with using intuition is the fact that raters do not always know what they are looking for (Wray, 2008, p. 107). For example, Eyckmans, Boers, and Stengers (2007, p. 7) have reported a "conservative" and "all-inclusive" approach of native speakers to identifying chunks in text. Moreover, some of the more problematic features of chunks - such as nesting and vague borders - can make such decisions rather arbitrary (Wray, 2002, p. 28).

To help validate intuitive decisions, Wray (2008, pp. 113-127) provides a very useful checklist. This is not to replace other methods of identification or to replace intuition, but to make the reasons behind intuitive decisions explicit. The checklist seems to be based on the observation that the defining features of formulaic sequences form a continuum: a chunk might show all or one defining feature (such as non-compositionality) to a certain degree, and not all features are needed to identify a chunk of language as formulaic. Also, the checklist

takes into account conventionalization, regardless of the exact nature of the chunk. For instance, a specific word combination of any length and internal structure can be regarded as formulaic if "based on direct evidence or my intuition, there is a greater than chance-level probability that the writer will have encountered this precise formulation before in communication from other people" (Wray, 2008, p. 120, point H).

Function-first approach (Durrant & Mathews-Aydınlı, 2011) is a combined method in which a corpus is first annotated for functions, and then identifies formulas as the recurrent linguistic items associated with those functions. When dealing with small corpora, this approach has an advantage over frequency-based approaches because it takes into account the communicative context and the "message-expression ratio": some messages are expressed less frequently than others, so the forms will also be less frequent (Wray, 2002, p. 31). That is, rather than deriving chunks on the basis of pure frequency, it identifies as formulaic those expressions frequently used for a certain message. This is in line with Granger and Paquot's (2008) "preferred ways of saying things".

To sum up, the definition and identification of chunks in written texts can be approached differently, building on a range of formal criteria. However, it has been recognized that criteria can be problematic. This may not be a problem in itself, but preliminary analysis of our data in L2 development suggested that such nuances in chunk use really matter and should be captured. Firstly, the characteristic features form continua rather than discrete categories, so it may be difficult to clearly categorize different types of chunks. For instance, *get on* is classified as a phrasal verb; however, it can be more or less semantically compositional, depending on its use: compare *get on the bus* and *get on with someone*. Next, it may be difficult to distinguish between formulaic and non-formulaic word sequences. For instance, the expression *when I grow up* may not be considered a chunk in a traditional approach, but in the context of L2 use, it may be intuitively more formulaic than the learner expression *when I am a grown up adult*. Also, since chunks can be nested, it may be difficult to define the exact borders of a chunk: for instance, the phrase *the only thing I know for sure* can in itself be classified as an attitudinal formula but consists of several nested chunks (*for sure* and *know for sure*).

So in defining and identifying chunks in text one has to make a choice between a very specific and narrow definition (e.g., chunks can be defined as two-word collocations), which will reliably identify certain chunk types but

necessarily exclude others; or, an inclusive, less reliable definition (e.g., a formulaic sequence as defined by Wray, 2002, p. 9 referred to as "admirably open" by Ellis, 2012, p. 26). As Wray points out, the definition of a chunk in fact relies on what chunks are initially identified in the text, and how methodological difficulties are resolved very much depends on the theoretical position one takes and on the exact direction of the research.

Defining and operationalizing chunks is also very much related to the theoretical perspective one takes to language. The current study takes a usage-based perspective for several reasons: because of their perspective on language structure and language learning, usage-based approaches can account for the more problematic structural properties of chunks such as continua, nesting, overlaps, and chunking at different levels; the place of chunks in the language system, their acquisition, and development over time. In terms of identification in text, usage-based approaches can lend support to intuitive judgments of formulaicity. Finally, grounding chunks within a usage-based approach can provide useful insights into what is relevant when studying L2 development, and thus help identify relevant research questions. The next section will therefore give a brief overview of a usage-based approach.

2.4. A usage-based approach

Usage-based approaches see language as part of human cognition, as a tool for making meaning in a social context (Ellis & Cadierno, 2009; Tomasello, 2003), which is crucial for usage-based accounts of language structure and language learning. A number of specific models of language build on this assumption and so fall under the usage-based umbrella (Tyler, 2010). This dissertation is inspired by cognitive-constructionist and dynamic approaches, which I found to be suitable for researching chunks in L2 development.

2.4.1. Usage-based perspectives on language structure

Cognitive-constructionist approaches see language as a structured inventory of conventionalized form-meaning mappings, also called symbolic structures (Langacker, 2008a) or constructions (Goldberg, 2006), which symbolize meaning and are used for purposes of communication. They have different degrees of specificity, ranging from lexically specific units such as words and idioms, to abstract syntactic constructions such as past-tense *-ed* or the passive

construction (Tomasello, 2003; Langacker, 2008a, Ellis & Cadierno, 2009). According to Langacker (2008a, p. 15) each symbolic structure is defined by its semantic pole (the function/meaning) and phonological[4] pole (the form). In fact, Langacker stresses that the semantic and phonological properties are all that is needed to define a symbolic structure (p. 15). Productivity and creativity in language are not seen as the product of autonomous syntax but as the result of abstract productive constructions such as the verb-argument construction (V Obj $Obl_{path/loc}$, as in *put it on the table*). Consequently, usage-based approaches do not draw strict lines between traditionally defined language modules such as syntax and lexicon.

Dynamic approaches such as Dynamic Systems Theory (De Bot, Lowie, & Verspoor, 2007; Verspoor & Behrens, 2011) and Chaos-Complexity Theory (Larsen-Freeman, 2011; Larsen-Freeman & Cameron, 2008; Beckner et al., 2009) see language as a complex adaptive system and as such it is expected to display certain characteristics both in its structure and in its development. Similarly to other complex systems, observed regularities emerge from complex interactions of a multitude of variables over time. Specifically, the regularities in language we call grammar are not rule-based but emerge as patterns from the repeated use of symbolic form-meaning mappings by speakers of the language. Therefore, grammar is not a set of creative rules but a set of regularities that emerge from usage (Hopper, 1998). Emergent structures are nested; consequently, any utterance consists of a number of overlapping constructions (Ellis & Cadierno, 2009). Linguistic categories are also emergent, which means that not all linguistic structures neatly fall into prescribed categories (emergent categories are not created top down but emerge bottom-up). Consequently, some linguistic structures are prototypical, while others fit their category less well.

2.4.2. Usage-based perspectives on language learning

From a usage-based perspective, language learning is the learning of constructions during usage events by mapping form onto meaning (Ellis & Cadierno, 2009). One of the most important factors in the process is frequency of forms in input: language users are sensitive to frequencies and discover language patterns through exposure to language input. High token frequency

[4] Note that under phonological, Langacker includes not only sounds but also gestures and written forms.

(i.e., frequent occurrence of a particular form in the input) leads to the entrenchment of whole lexically specific units, whereas high type frequency (i.e., a high number of different lexical items that can be inserted in a construction slot) leads to the establishment of productive schematic constructions (Ellis, 2011). Frequency of forms interacts with other psycholinguistic factors, such as prototypicality of meaning. For instance, abstract constructions that enable syntactic creativity such as the verb-argument construction V Obj $Obl_{path/loc}$ (VOL) develop gradually by abstracting common patterns from lexically specific exemplars such as *put it on the table* (Ellis & Ferreira-Junior, 2009b; Tomasello, 2003, pp. 315-318). The exemplar itself is a highly frequent instantiation of the VOL construction, and the verb *put* that it contains is prototypical in meaning. This means that *put* is the verb most characteristic of the VOL construction and so the one most frequently used. Other verbs in VOL are used less; the type/token distribution of all verbs used in the VOL construction is Zipfian (i.e., the verb *put* is the one most frequently used, about twice as frequently as the next verb). Such prototypes are crucial in establishing the initial form/meaning mapping – in this case, the phrase *put it on the table,* meaning caused motion (X causes Y to move to a location). Repeated exposure to other instantiations of the VOL construction will gradually lead to generalization and the establishment of the abstract productive construction.

An important aspect of language learning is its dynamic development over time (Verspoor & Behrens, 2011). In all complex adaptive systems (such as weather or language), change over time is non-linear, dynamic, and so to a great extent unpredictable. This is the result of complex interactions of multiple subsystems, their initial conditions, and their changing relationships over time. Such interactions are possible because the subsystems are completely interconnected (such as lexicon and grammar as part of language); moreover, each complex system is open and continually interacts with other complex systems, which it may be part of (such as language being part of and interacting with cognition). Change in the system can only take place after the system has become unstable, which is manifested as a period of increased variability in the system's behaviour. Increased variability may lead to rapid development: periods of great variability may be followed by a leap to the next developmental level (for instance, a learner's language may be full of trials and errors in a certain linguistic structure just before the learner masters it fully). Variability that leads to rapid development is referred to as meaningful

variability. When in its next developmental stage, the system becomes more stable and its behaviour is less variable – this is described as narrowing bandwidth of variability. Such changes over time can be plotted in line graphs, which record the system's developmental trajectory (Verspoor & van Dijk, 2011). Dynamic approaches to language development therefore see variability as precursor of change and learners' developmental trajectories over time as an important source of information about their language development[5] (Verspoor, Lowie, & van Dijk, 2008).

While most of the usage-based mechanisms described for L1 development also apply to L2 development, constructing an L2 is different from constructing an L1. There is an additional "layer of complexity" (Ellis & Cadierno, 2009, p. 12) in the L2 developmental process because there are many more variables involved. As in L1 development, frequency of forms in input is crucial but the amount and character of input may differ considerably for each L2 learner - which in turn means that different learners have different L2 resources available and develop differently. For example, instructed learners of English as a foreign language may not have enough exposure to authentic input; also, learners at lower levels of L2 proficiency will have had less exposure than learners at higher levels. Moreover, L2 learners' cognitive systems are tuned to L1 input, which creates all sorts of processing biases when analyzing L2 input; this in turn may hinder the acquisition of L2 linguistic forms. In addition, there is a multitude of age- and context-related individual differences, especially in post-childhood L2 learners. So when learning L2 constructions – i.e., the form-meaning mappings conventionalized in the L2 – L2 learners may follow different developmental paths from L1 users.

Learners' L1 is one of the most important factors in how they construct form-meaning mappings in their L2. As opposed to young children learning L1 constructions alongside L1 concepts, L2 learners already have their L1 constructions and L1 concepts in place, together with "myriad categories and schema" (Tyler, 2012, p. 89) and tend to construct their L2 on top of their L1. From a usage-based perspective this means that learners will carry the meanings and the constructions mapping onto the meanings from their L1 to their L2. Such influence is then manifested in L2 production. Research on L1

[5] Dynamic approaches talk about "language development" rather than "language acquisition" because the language system is seen as something that the learner constructs actively, rather than a uniform set of linguistic forms that the learners acquire (Larsen-Freeman, 2011, p. 79).

influence from a Cognitive Linguistics perspective has primarily been done in semantic domains of space, time, and motion, often in typologically very different languages (Cadierno, 2008). Odlin (2008) distinguishes between meaning transfer and conceptual transfer. Meaning transfer involves various kinds of semantic and pragmatic influence from the L1, such as mapping L2 prepositions onto L1 spatial meanings (Lowie & Verspoor, 2004; Jarvis & Odlin, 2000). Conceptual transfer, which involves transfer of L1 construal[6], shows the impact of language on cognition, and so the impact of L1-specific concepts on L2 use. For example, speakers of different languages may conceptualize the same events differently and may describe them in different ways and/or from different perspectives (Cadierno, 2008). Similarly, Slobin (1996) coined the term "thinking-for-speaking", "a special form of thought that is mobilized for communication" (p. 76), which in essence means that "children who learn different languages end up with different conceptual structures […] these differences have pervasive cognitive effects" (p. 70) and that "in acquiring a native language, the child learns particular ways of thinking for speaking" (p. 76). The role of L1 may also be more or less prominent depending on the learners' general proficiency. Learners in lower and intermediate stages of L2 acquisition tend to construct / establish form-meaning mappings in the L2 based on their entrenched L1 constructions (Cadierno, 2008).

To conclude, a dynamic usage-based perspective on language and language learning carries with it a set of specific theoretical assumptions about what language is, how it is learnt, and how it develops over time. These assumptions will influence the way we conceptualize chunks, how we define them, and how we investigate their development in L2 learners.

2.4.3. Chunks from a usage-based perspective

From a usage-based perspective chunks can be seen as conventionalized form-meaning mappings. Because usage-based approaches do not draw strict boundaries between traditional language subsystems such as grammar and lexicon (Römer, 2009), the question of where chunks belong – whether in the lexicon or in a separate module such as phraseology - is less relevant. Contrary to traditional views of language, usage-based approaches see chunks as central to language structure.

[6] "Construal" is a Cognitive Linguistics / cognitive semantics term referring to different ways of viewing the same reality (Verhagen, 2007).

In terms of language as a complex system, chunks can be seen as the result of repeated use of certain linguistic units, which then give rise to emergent patterns in language at all levels of organization and specificity (from two-word collocations to collostructions to clause collocations, etc.), which may lead to nesting (nested chunks). Observed chunk categories (i.e., different chunk subtypes) are also emergent, which means that characteristic features of chunks form continua, rather than closed categories. This explains why some chunks are prototypical examples of the categories, while others are more marginal – and, consequently, why some word sequences may be more readily recognized as chunks, while others less so.

This has implications for the definition and identification of chunks. A usage-based approach allows for the inclusion of chunks at the far end of feature continua: word sequences do need not be semantically opaque (*spill the beans*) or structurally irregular (*by and large*) to be considered chunks; nor do they have to be highly frequent. Even structurally regular, semantically compositional sequences with or without a discourse function can be seen as conventionalized mappings of meaning and form, because they are the preferred word combinations out of all the options in principle allowed by the grammar and lexicon of the language as traditionally described ("preferred ways of saying things", Granger & Paquot, 2008; "normal ways of saying things", Langacker, 2008b). In this sense, even such sequences can be regarded as chunks.

From a usage-based perspective, "formulaic" could be understood as "conventionalized", which brings about methodological pros and cons. Wray (2012) suggests that perhaps all units of language are formulaic, it is "formulaicity all the way down" (p. 245), similar to Goldberg's "constructions all the way down" (Goldberg, 2006, p. 18), that is, conventionalized form-meaning mappings at all levels of the language system. This line of thinking resonates with Hopper's (1998) demonstration of formulas at different levels – even including single words (p. 168). In this sense, identifying chunks in native-speaker repertoire is a daunting task: if we take a usage-based perspective, where all units of language are conventionalized – and so all are in a sense formulaic, identifying chunks would become pointless, since we could say that all in language is in fact a chunk. This may explain the findings of Eyckmans, Boers, & Stengers (2007) study, where some native speakers took a conservative and others an all-inclusive approach to identifying chunks in text. However, in written L2 data the identification of chunks may be easier - especially in L2

learners at lower levels of proficiency. Since L2 learners tend to use language in terms of grammar and individual orthographic words, they often combine words in awkward ways. L2 learners often lack the natural, seamless flow of native-like language use so there may be fewer overlaps and nesting, which can make the isolation of chunks easier. Also, since from a usage-based perspective chunks can be defined as the conventionalized ways of expressing certain concepts, and since L2 learners may establish form-meaning mappings differently than L1 users, chunks in L2 data can be identified as the conventionalized ways of expressing certain concepts as opposed to other ways which may in principle be possible in accordance with the grammar and lexicon of the language (Langacker, 2008b).

Moreover, from a usage-based perspective, proficient language users will be able to recognize conventionalized sequences: their cognitive systems are tuned into frequencies of occurrence so they have strong intuitions about how things are normally said. This is also in line with the already mentioned message-to-formula ratio (Wray, 2002; Durrant & Mathews-Aydınlı, 2011), i.e., that there are most frequently used formulas for a certain message (or function); and with Wray's checklist for validating intuition, which makes use of the fact that conventionalized expressions are repeated in communication (Wray, 2008, p. 120, point H). To sum up, native or highly proficient language users should be able to recognize chunks in L2 written texts as the conventionalized L1 ways of expressing a certain concept.

To sum up, a usage-based perspective where all units of language are conventionalized form-meaning mappings allows for quite a broad definition of what counts as a chunk, including expressions that may traditionally be seen as free word combinations. The dynamic usage-based perspective and its implications for the definition and identification of chunks in learner texts is in my view one of the contributions of this dissertation.

2.5. Questions addressed in this dissertation

Taking a dynamic usage-based approach, this dissertation sets out to research chunks in written L2 English texts produced by a large group of young Dutch L2 learners in high- and low-input conditions (semi-immersion and regular instructional settings). As shown in this chapter, a dynamic usage-based perspective on chunks in L2 development leads to a number of interesting questions.

Firstly, we are interested in effects of greater exposure to L2 input on the learners' development of chunks over time. Since input is seen as crucial for successful L2 development, we may assume that L2 learners exposed to greater amount of authentic input will also be more successful in their development of native-like chunks than L2 learners with less exposure. Accordingly, the main question addressed in Study 1 (Chapter 3; Smiskova & Verspoor, in press) is whether there are any differences in chunk development between high- and low-input learners. However, chunks in written texts are difficult to define and identify; also, from a usage-based perspective learners' experience of the L2 may be different, which may lead to different use of chunks by different learners. Therefore, an additional question addressed in the study is what chunk measures best capture the potential differences between high- and low-input learners. The study takes a data-driven, holistic approach to the definition and identification of chunks in L2 learner texts. We use researcher intuition supported by Wray's (2008) checklist for validating intuition, supplemented by frequency searches in reference corpora; moreover, we develop a suitable chunk typology based on Granger & Paquot's (2008) integrated approach to phraseological units.

Secondly, we are interested in the learners' developmental trajectories, especially in the role of variability in the learners' acquisition of chunks. We may assume that patterns of chunk development will be different in high- and low-input learners because of their different exposure to input. High-input learners' developmental patterns may show more meaningful variability, which may lead to more successful chunk development than in low-input learners. Therefore, the main questions addressed in the second study (Chapter 4; Verspoor & Smiskova, 2012) concern the exact dynamics of chunk development over time in individual high- and low-input learners, potential similarities and differences in their developmental trajectories, and the presence or absence of meaningful variability. The study uses DST analytical and visualization

techniques (Verspoor, de Bot, & Lowie, 2011) to study patterns of variability in the learners' developmental trajectories over time.

Thirdly, we are interested in how the usage-based concept of conventionalization may contribute to the study of chunks that lie towards the end of the traditional continuum of defining features. From a usage-based perspective, conventionalized linguistic forms mapping onto certain concepts are used more frequently than other, grammatically possible forms for the same concept. At the same time, proficient users of the language are sensitive to conventionalized forms. Chunks that may be considered free rather than fixed word combinations from a traditional perspective (such as *when I grow up*) can be understood as "conventionalized ways of saying things" (CWOSTs). The main aim of Study 3 (Chapter 5; Smiskova, Verspoor, & Lowie, 2012) is to see how these chunk types can be operationalized as CWOSTs so that they can be researched in L2 development. We use a concept-first approach - similar to Durrant & Mathews-Aydınlı's (2011) function-first approach - to identify all expressions of a certain concept in the learner texts. We use two measures of conventionalization, native speaker judgment of naturalness and frequency of occurrence in a reference corpus (WebCorp; Renouf, Kehoe, & Banerjee, 2007) to capture CWOSTs as the preferred ways of expressing a certain concept.

Finally, we are interested in the role of the learners' L1 Dutch together with L2 frequency in how they initially establish chunks. From a UB perspective, L1 plays an important role in how learners establish form-meaning mappings in their L2, so one of the main reasons for L2 learners' difficulties could be their already entrenched L1 constructions. At the same time, UB approaches stress the role of frequency of L2 forms in input so we can expect that L2 learners at lower stages of L2 proficiency will be drawing on their L1 more because they've had less exposure to L2 chunks. Initially, the study employs a concept-first approach to isolate learner expressions referring to the same concept. Drawing on cognitive-constructionist approaches to the study of L1 and L2 (Ellis & Ferreira-Junior, 2009b; Dabrowska & Lieven, 2005), the learner expressions are then analyzed for emergent patterns of use. These are in turn used as evidence for how learners draw on their existing resources (entrenched L1 constructions and frequent L2 forms) in order to compensate for the unavailability of the CWOST when referring to a beyond-word-level concept.

Chapter 3

Development of Chunks in Dutch L2 Learners of English[7]

3.1. Introduction

Evidence from various research disciplines has demonstrated that a substantial part of native speaker repertoire consists of a wide range of conventionalized expressions (Ellis, 2008; Sinclair, 1991; Wray, 2002), which in this paper are generally referred to as *chunks*. Many chunk types are part of traditional phraseology and clearly recognizable as fixed units, such as *of course; living room; grow up; the sky is the limit* but those most pervasive in native-like repertoire are simply "normal ways of saying things" (Granger & Paquot, 2008, p. 35; Langacker, 2008b, p. 84). These are the preferred ways of expressing certain notions out of all the grammatically correct options available: Compare for example *Will you marry me?* and *Would you like to become my spouse?* (Pawley & Syder, 1983). Although many chunks are highly context-specific, in general the proportion of chunks in native-like written language has been estimated at about 50% (Erman & Warren, 2000) and it tends to be even higher in native-like spoken language (Ellis, 2008a, p. 4).

Since chunks are such a pervasive feature of a native-like repertoire, they are also a crucial aspect of L2 development. Verspoor, Schmid, & Xu (2012) have shown that the number of chunks used in written texts is one of the better

[7] This chapter is a slightly edited version of Smiskova, H., & Verspoor, M. H. (in press). Development of Chunks in Dutch L2 Learners of English. In Evers-Vermeul, J., Rasier, L., & Tribushinina, E. (Eds.), *Usage-Based Approaches to Language Acquisition and Language Teaching* (SOLA), Mouton de Gruyter. Results of statistical analyses are reported as required by the editors of the volume.

measures to distinguish among five L2 English proficiency levels (from beginner to high intermediate). Chunks contribute to fluency and authenticity of L2 use and may also speed up general linguistic development. However, it is precisely this feature of the target language that is often the greatest obstacle for L2 learners. Although the classroom context does focus on chunks, the range is limited (Eyckmans, Boers, & Stengers, 2007) and often does not include "normal ways of saying things" as they are not part of traditional phraseology, grammar or lexicon (Langacker, 2008b, p. 84). Most importantly, classroom context often provides only limited exposure to authentic input, which from a usage-based perspective is absolutely crucial.

From a usage-based perspective, L2 development is primarily driven by frequency and salience of structures in the surrounding input (Ellis & Cadierno, 2009). In theory, this means that sufficient exposure to authentic input in the target language - where chunks are very frequent - will drive the learning of chunks of the target language. But even when immersed in authentic input, L2 learners' attention tends to be focused on individual words rather than on word combinations (Wray, 2002, p. 6). Individual words such as *school* are learned separately and earlier than two-word expressions such as *at school*, because for L2 learners single words tend to be more salient as units than multi-word expressions (chunks). Similarly, "preferred ways of saying things" may not be sufficiently salient as a unit in order to be learned as a chunk. The sensitivity to how words go together in authentic language is crucial for the learning of chunks and is most likely heightened by more exposure to authentic input (Ellis & Cadierno, 2009). There are numerous individual differences in how L2 learners learn and use chunks (Schmitt & Carter, 2004), which is also in line with the usage-based perspective assumption that individual learners construct their L2 differently depending on their exact experience of the L2. Moreover, as Verspoor & Smiskova (2012) maintain, L2 learners may also show great variability in their development of chunks over time. In this study, individual differences will be considered in relation to the amount and kind of input L2 learners are receiving and in relation to individual variability in development over time.

In short, learning chunks is an important part of L2 development and tracking learners' use of chunks can give us valuable insight into the process of L2 development. In this paper, we will report on a data driven study in a group of 22 Dutch L2 English learners; 11 in a semi-immersion instructional (high-input) condition and 11 in regular instructional (low-input) condition. Our main

aim is to track the development of chunks in these learners, with a close focus on the potential differences between the high and low-input conditions. Taking a usage-based perspective, we expect that the learners' use of chunks will reflect the amount and kind of input they are receiving. We expect the learners to use chunks that are generally frequent and/or salient in L2 English and chunks that are frequent and/or salient in their specific L2 environment. The high-input learners are expected to use more chunks and a greater range of chunk types than the low-input learners. To gain insight into the actual developmental process of using chunks over time, we zoom in on two learners selected from our group and conduct a case study from a dynamic usage-based perspective (Verspoor & Smiskova, 2012).

Since chunks are a complex linguistic phenomenon and our study of chunks in L2 development is data driven, we will first explain our operationalization of chunks and give a detailed description of the method employed in our study. Next, we will present and discuss the findings of our longitudinal study of chunk development. With our findings we hope to show that chunks, as we define them, develop differently in high and low-input learners and that tracking learners' use of chunks can give us important insights into L2 development from a usage-based perspective.

3.2. Operationalizing chunks

In order to track the development of chunks in learner data we need an exact definition of a *chunk*. However, as a linguistic phenomenon, chunks are notoriously difficult to capture. The exact operationalization depends on the purpose of the study and the nature of the data in question (Wray, 2002). Since this study investigates the development of native-like chunks in learner language from a usage-based perspective, we need a highly inclusive definition. In order to build this definition, we followed a cyclical process of definition and identification of chunks in our data (Wray, 2002, p. 19). First, we consulted the learners' writings to see what types of chunks they contain; next, based on this exploratory stage we built a general definition of a chunk; and finally, this data-derived definition then served to identify more instances of chunks in the data. This is a dynamic approach that fits well with a usage-based perspective and our data-driven study.

The exploratory stage revealed that the learners in our study used not only multi-word expressions which are part of traditional phraseology (such as

human body; sick and tired; boss around) but also expressions that are the preferred ways of saying certain things. Compare *when I grow up* and *when I am a grown up adult* in the following two excerpts from learner texts (Chapter 5; Smiskova, Verspoor, & Lowie, 2012):

(1) *When I am a grown up adult i would like to be a neurosurgeon. I would like to be a neurosurgeon when i am a grown up because i really like biology and i think i am quite good at it. I also think the human body is very interesting. It's so special how everything is organised so well and that most of the time works.*

(2) *I seriously have no idea what kind of job I'd like to do. And I'm getting sick and tired of people who ask me that. Just because of that I'm in eight grade, I'm probably supposed to know what I want to do when I grow up. (…) I absolutely don't like it when people boss me around.*

Based on the exploratory stage, we defined a chunk as a conventionalized word sequence expressing a certain concept. The same concept could also be expressed by a word sequence which, while following rules of syntax correctly, is not a preferred word combination; compare *at school* vs. *in school; do homework* vs. *make homework*; *when I grow up* vs. *when I am a grown up adult*. In other words, a chunk for the purposes of this study is defined as a combination of two or more orthographic words[8], which may also include variable slots, expressing an idea (concept) in a conventionalized way. Such definition is in line with Langacker`s (2008b) notion of units representing normal ways of saying things:

> A substantial proportion of what is needed to speak a language fluently tends to be ignored because it is part of neither lexicon nor grammar as these are traditionally conceived. What I have in mind are the countless units representing normal ways of saying things. Native speakers control an immense inventory of conventional expressions and patterns of expression enabling them to handle a continuous flow of rapid speech. While they can certainly be included, I am not referring to lexical items of the sort found in dictionaries, nor even to recognized idioms. At issue instead are particular ways of phrasing certain notions out of all the ways

[8] Compounds which are hyphenated or written together as an orthographic word are also included (e.g., *however*).

> they could in principle be expressed in accordance with lexicon and grammar of the language. These units can be of any size, ranging from standard collocations to large chunks of boilerplate language. These can be fully specific or partially schematic, allowing options in certain positions. (Langacker, 2008b, p. 84)

In order to distinguish between different types of chunks identified in the learner data, our aim was to classify the identified chunks in established typological categories. In fact, we found that using a typology of established chunk types was also helpful in the initial identification stage. Based on our definition, we were aiming for a typology of chunks which would include both established phraseological chunk types and "preferred ways of saying things". Since this is precisely what Granger & Paquot (2008) advocate, we chose to follow their classification approach. They propose the integration of two major approaches: the traditional *phraseological approach*, which is based on linguistic analysis, strictly distinguishes between phraseology and syntax and is mostly concerned with specific phraseological categories, most often non-compositional (idiomatic, semantically opaque, such as *kick the bucket*) and/or syntactically irregular (such as *by and large*). The second is a *corpus-based, frequency-distributional approach,* which has produced extensive evidence of frequently occurring semantically and syntactically regular word combinations, which are not part of traditional phraseology.

The formal typology of phraseological units proposed by Granger & Paquot (2008, pp. 43-44) served as basis for the typology of chunks we used in this study (See Table 1 in Appendices). The original typology has three functional categories: *referential* (chunks which refer only to content and have no pragmatic function), *textual* (chunks with a discourse structuring and organizational function) and *communicative* (chunks with a communicative function, e.g. addressing interlocutors). These functional categories are then subdivided on the basis of structural types and degrees of non-compositionality (idiomaticity). In our study, we further grouped these into organizational levels (phrase or sentence level). Finally, we included "preferred ways of saying things" (namely, conventionalized sentences and conventionalized sentence stems), and additional categories based on the exploratory analysis of our data: structures, variable idioms (Stefanowitsch & Gries, 2003, p. 43) and constructions. Table 1 in Appendices shows the modified typology including examples from our data.

However, when using any typology for a fine categorization of chunks it is important to bear in mind that we are imposing a fixed structure on a fuzzy, emergent phenomenon that may not have entirely fixed categories. The defining characteristics of chunks – such as non-compositionality, fixedness, function – tend to be present to a certain degree. This means that each formal category defined by these characteristics has prototypical examples, but there may also be word sequences in that category that do not display the defining characteristics to the same degree. Compare for instance the varying degrees of non-compositionality (idiomaticity) in *blow a fuse – blow your own trumpet – blow the gaff* (Granger & Paquot, 2008). This is due to the fact that these defining characteristics form a continuum rather than clear-cut categories; and this in turn is caused by the overlap between morphology, syntax, semantics and discourse (Granger & Paquot, 2008, p. 37). Moreover, many chunks are nested, i.e. consisting of smaller, often overlapping chunks (Wray, 2002, p. 28), such as in *[[[The only thing] I [[know [for sure]]*, which can complicate the process of counting and classifying chunks.

Therefore, the typology of chunks presented here is intended as a helpful inventory of prototypes that may be further refined on the basis of more data analysis. Its categories should be perceived as dynamic and open rather than fixed and mutually exclusive; for instance, a chunk can display the defining characteristics of several categories (e.g. *however* is a linking adverbial in its function as well as a compound in its structure).

In resolving these and other complexities involved in researching chunks, it is crucial to closely adhere to the aim and background of the study (Wray, 2002, p. 28). In our case, this involved making decisions in line with the usage-based perspective in order to tease out differences in development between our high and low-input learners. In the following section, we describe in detail how chunks were identified and classified in this study and how we ensured consistency of the process.

3.3. The study

This paper reports on two longitudinal studies investigating the development of chunks in learners' language over about 2.5 years in high and low-input conditions. The first is a group study, in which two groups of learners in two conditions (high and low-input) are compared at the beginning and the end of

the study. The second is a case study, in which the development of chunks is traced of two selected learners across 12 data points over time.

3.3.1. Participants and data collection

Our participants are 22 Dutch high school learners who attend the same Dutch school, have a similar socio-economic background, and a similar scholastic aptitude (Verspoor et al., 2010). Both groups have an interest in language as the high-input group opted for a bilingual Dutch-English stream and the low-input group for monolingual (Dutch) stream that includes classical languages. At the start of the study the learners were about 11 years old in their first year at high school. The high-input group attended an education program in which subjects such as geography, history, were taught in English. This group also had five hours of English as subject taught by a native speaker of English. In the high-input condition, students are exposed to a great amount of spoken English by both non-native and native speakers of English; most of their course materials are the same as used by native speakers. The low-input group attended a Dutch regular education program with all subjects taught in Dutch. This group had 2 hours of English a week also taught by a native speaker of English, but the course materials, even though communicative contain quite a bit of explicit grammar instruction. This group also had 2 hours in Latin and Greek.

The learners were asked to write about once a month on informal topics such as *My new school* or *My vacation*, *Write about the rules at home. Do you think they are fair?*; *What do you want to be when you grow up?*; *Write about a film or a book you like*. Most of the writings were written directly on computer, where the word limit was 200 words; some were handwritten in class. There was no time limit for the writings, but the students usually wrote no longer than 10 minutes.

3.3.2. Identification of chunks in written texts

First, we used researcher intuition to identify multi-word expressions which could match our general definition of a chunk. To help validate such intuitive decisions, we used Wray's (2008, pp. 113-127) list of diagnostic criteria. Following Wray's instructions (2008, p. 115), we only used the criteria to validate expressions we had already intuitively identified as chunks, rather than using the criteria to initially identify chunks. If needed, which was mostly in the case of "prefered ways of saying things", intuitive judgments were

further validated with the help of reference corpora. The reference corpora were used to confirm that a multi-word expression we intuitively identified as a chunk indeed frequently occurred in the corpora as a conventionalized unit. This step was based on the underlying notion of frequency, but not on detailed frequency or mutual strength counts[9]. In principle, this step gives further support to the criterion in point H of Wray's list of diagnostic criteria:

> By my judgment, based on direct evidence or my intuition, there is a greater than chance-level probability that the writer will have encountered this precise formulation before in communication from other people. (Wray, 2008, p. 120)

In addition to standardized reference corpora, such as the BNC (Davies, 2004) and COCA (Davies, 2008), we also used the WebCorp search engine (Renouf, Kehoe, & Banerjee, 2007), which allowed us to search the World Wide Web as a reference corpus. WebCorp is particularly relevant in our study since we are following young teenagers who tend to have a great deal of exposure to the language of the Internet; moreover, a number of conventionalized expressions that do not occur in standardized corpora are frequently found on the Internet (e.g. *The only thing I know for sure is that* +clause).

As already mentioned, larger chunks were often nested, i.e. they contained smaller, overlapping chunks. The larger chunks were mostly "preferred ways of saying things", such as *the only thing I know for sure,* which includes a verb complement (*know*+clause) and a particle (*for sure)*. In these cases, the smaller chunks were not counted separately, as the composite larger chunk was perceived as a separate form-meaning/function unit in itself.

Finally, all identified chunks were categorized for type following our typology (Table 1 in Appendices). In the cases of chunks that display the defining characteristics of several categories, functional categories were given preference, since they are the more fundamental distinction in our typology. For instance, *however*, which is a compound in its structure as well as a linking adverbial in its function, was classified as a linking adverbial rather than a compound.

To ensure consistency of the identification process, all intuitive judgments were made by the first author, discussed and fine-tuned with the

[9] We were unable to use word association measures as at the time of our study Webcorp did not provide this type of statistical information (Renouf, Kehoe, & Banerjee, 2007: 53).

second author and validated as described in this section. To ensure all chunks were categorized consistently, the first author went through the coding process twice.

3.3.3. Method of analysis

In the cross-sectional study we used the procedure described in the previous section to identify chunks in texts written by the high-input learners (N=11) and low-input learners (N=11) at the start of the study (October 2007) and towards the end of the study (May 2009)[10]. Next, we established several measures of chunk use in order to tease out differences between the groups and within the groups over time.

First, we recorded the raw token frequencies of all chunk types in October 2007 and May 2009 to see which chunk types were most frequently used in each group and if their distribution changed over time. To discover variety in chunk use, we counted the number of different chunk types per text (chunk types/text). To be able to compare learners and groups, we calculated relative frequencies by taking text length into account: for relative token frequency we calculated the ratio of all chunk tokens per 100 words of text (chunks/100 words); for relative token frequency of each chunk type we calculated the type-token ratio of each chunk type per 100 words (type-token [chunk type]/100 words). To gain more insight into the use of chunks in relation to text length, we calculated the correlation between the length of each text and the number of all chunk tokens in it (correlation text length/chunks). To measure overall "chunk coverage" we calculated the percentage of all words used as part of a chunk in each text (%chunk-words/text). Finally, to capture differences in the development of chunk length we calculated the mean chunk length per text (mean chunk length/text).

Next, we performed statistical analyses on all these measures to see where there might be significant differences in development, both between the groups and within the groups over time (potential change from October 2007 to May 2009).

In the case study we used the same procedure for the identification of chunks texts written by two selected high-input and low-input learners. For each measurement over time (i.e. each collected text) we recorded the number

[10] Due to subject dropout we had to take May 09 as the end-point of our cross-sectional group study; the data for our microgenetic study was available until November 09.

of different chunk types and the raw token frequency of each chunk type. This way we obtained a longitudinal chunk profile for each learner, which allowed us to track each learner's individual development in detail over two years (October 2007 to November 2009).

3.4. Results group study

The results show that in October 2007 the low-input group wrote on average significantly longer texts than the high-input group (low-input mean 114.18, high-input mean 65.09 words, $p<0.05$) and in May 2009 the high-input group wrote on average significantly longer texts than the low-input group (high-input mean 157.72, low-input mean 103 words, $p<0.05$). We will first present the raw token frequencies of all chunk types identified in the texts and then the relative frequencies according to each measure.

3.4.1. Raw frequencies of chunk tokens and types

In total, 18 chunk types[11] were identified in all the texts together. Figure 3-1 shows raw token frequencies of each chunk type at the beginning of the study in October 2007 and Figure 3-2 at the end of the study in May 2009.

Figure 3-1 shows that the most frequent chunks at the beginning of our study were lexical collocations (e.g. *strong coffee; main character; first kiss*) followed by particles (e.g. *a lot of; at home; in English*), structures (e.g. *NUMBER years old*), compounds (e.g. *living room*), verb complements (e.g. *would like to; going to; have to; like sing; think + clause*) and conventionalized sentences (*It`s hard to explain*).

Figure 3-2 shows that at the end of the study the frequency distribution was quite different: verb complements had moved from their fifth place to become the most frequent chunk type; conventionalized sentence stems (e.g. *The only thing I know for sure is that*+clause) and attitudinal formulae (e.g. *I mean*) had moved into the top five most frequent chunk types, and structures moved down from their third place to become much less frequent.

[11] Not all of the 22 categories of our typology were expected to appear in the data, which indeed they did not (such as slogans, proverbs, similes and complex textual organizers).

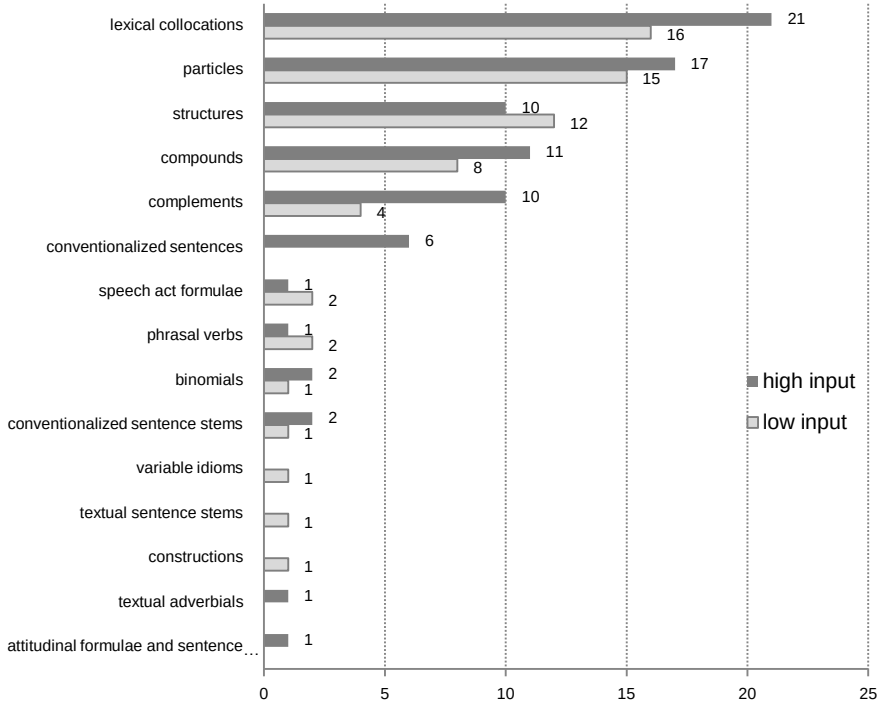


Figure 3-1: Raw token frequency of each chunk type in high- and low-input group in October 2007.

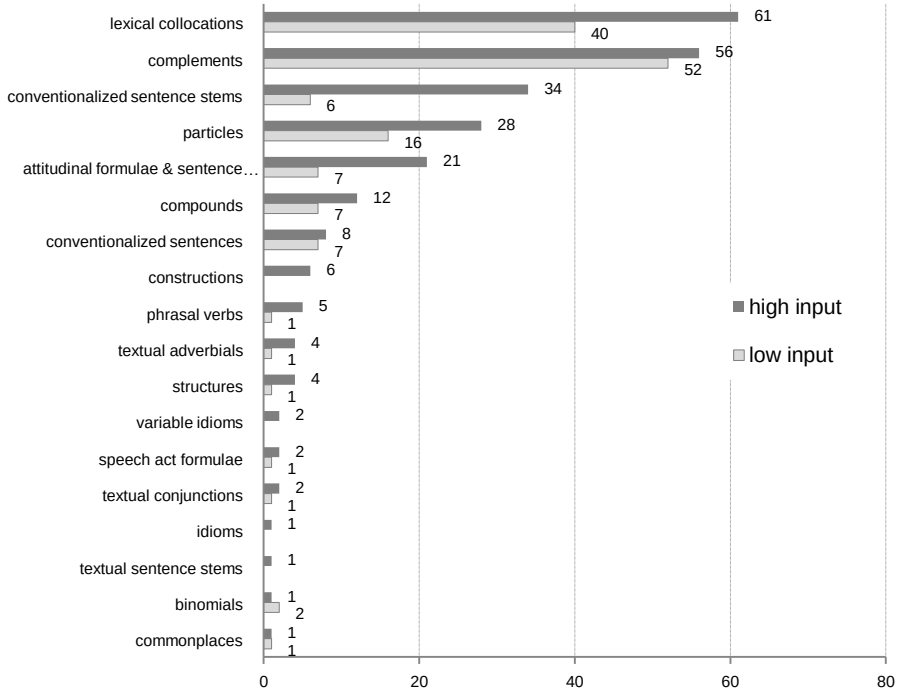


Figure 3-2: Raw token frequency of each chunk type in high- and low-input group in May 2009.

3.4.2 Relative frequencies of chunk tokens and types[12]

The relative chunk token frequency: In October 2007 the high-input group used on average significantly more chunks per 100 words (mean 10.62, $p<0.05$) than the low-input group (mean 4.97). Repeated measures ANOVA shows that over time, the measure increased significantly more in the low-input group ($F(1,20)=5$, $p<0.05$) than in the high-input group. Figure 3-3 shows the time/group interaction chart. Post hoc pair-wise comparison (paired samples t-test) shows that there was a significant increase between October 2007 and May 2009 in both low-input ($p=0.000$) and high input group ($p=0.044$). In May 2009 there were no significant differences between the groups in the average number of chunks per 100 words ($p>0.05$).

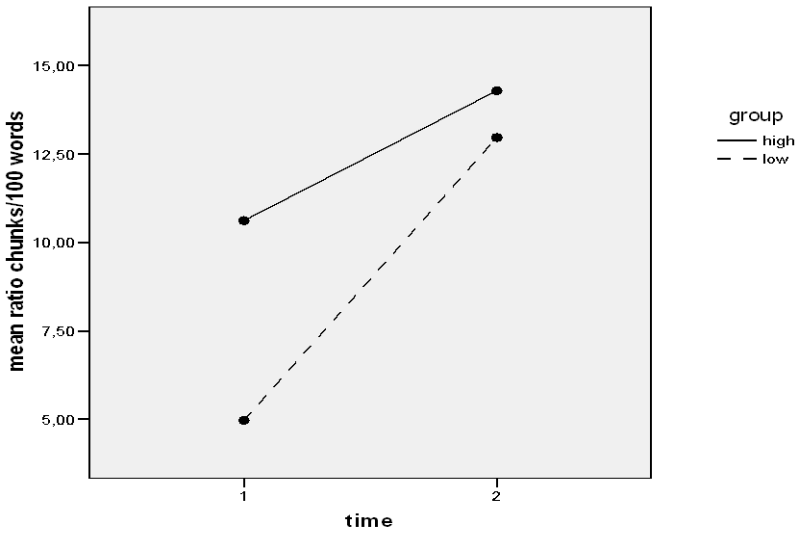


Figure 3-3: Increase over time in chunks/100 words (time/group interaction).

The relative chunk type frequency: In October 2007 there was no significant difference between the groups in the number of chunk types. Repeated measures ANOVA shows that over time, the number of chunk types increased

[12] For detailed results of statistical analyses see Table 2 in Appendix.

significantly more in the high-input group ($F(1,20)=5$, $p<0.05$) than in the low-input group. Figure 3-4 shows the time/group interaction chart. Post hoc pair-wise comparison (paired samples t-test) shows that the increase between October 2007 and May 2009 was significant in the high-input group ($p=0.001$) but not in the low-input group ($p=0.074$). In May 2009, the high-input group used significantly more chunks types per text (mean 7.0, $p<0.001$) than the low-input group (mean 4.55).

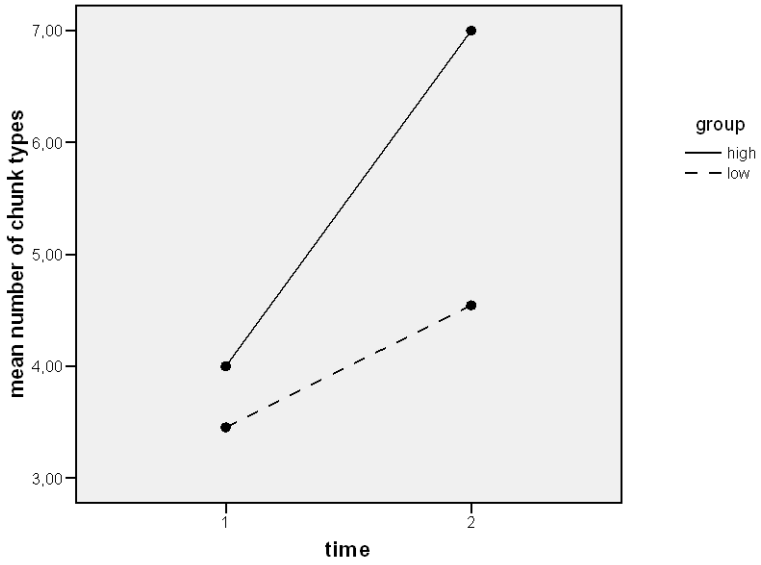


Figure 3-4. Increase over time in the number of chunk types (time/group interaction).

The relative token frequency of specific chunk types (ratio [chunk type]/100 words): Repeated measures ANOVA shows a time/group interaction in the ratio of two chunk types: verb complements and conventionalized sentence stems.

The ratio of verb complements increased significantly more in the low-input group ($F(1,20)=5$; $p<0.05$) than the high-input group. Figure 3-5 shows the time/group interaction chart. Post hoc pair-wise comparison (paired samples t-test) shows that the increase in the verb complements ratio between October 2007 and May 2009 was significant in both low-input ($p=0.001$) and high-input group ($p=0.015$).

The ratio of conventionalized sentence stems increased significantly more in the high-input group ($F(1,20)=10$; $p<0.05$) than in the low-input group.

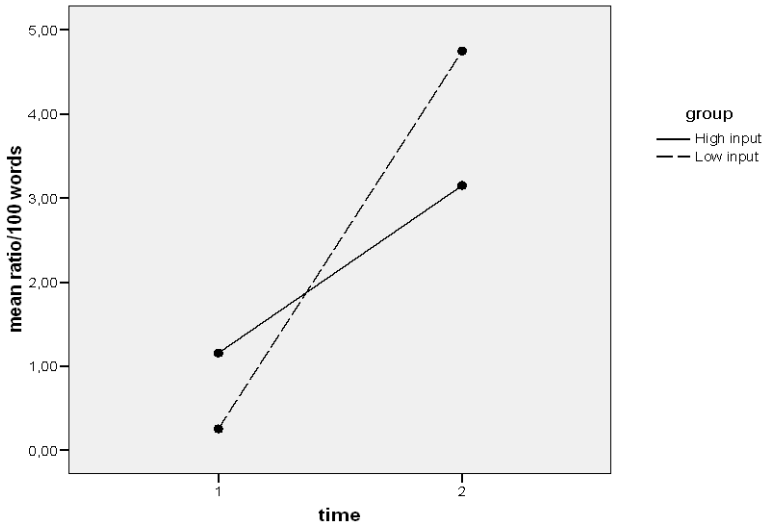


Figure 3-5: Increase over time in the ratio of verb complements (time/group interaction).

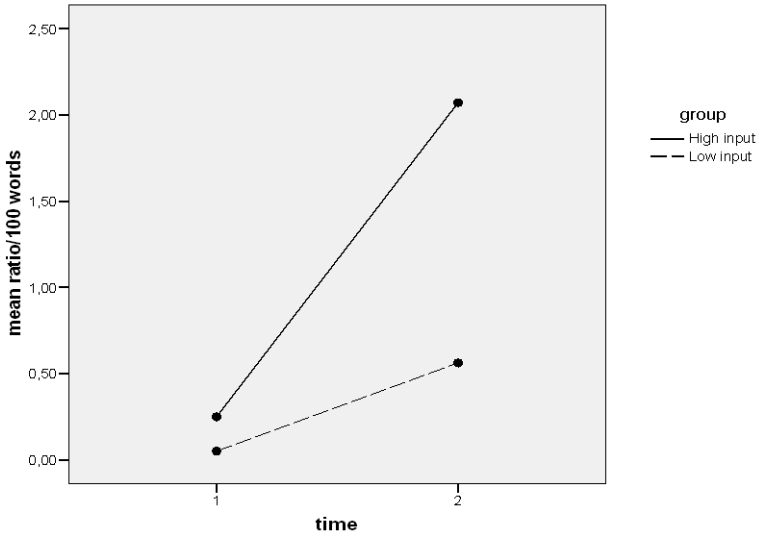


Figure 3-6: Increase over time in the ratio of conventionalized sentence stems (time/group interaction).

Figure 3-6 shows the time/group interaction chart. Post hoc pair-wise comparison (paired samples t-test) shows that the increase in the ratio of conventionalized sentence stems between October 2007 and May 2009 was significant in the high-input group ($p=0.000$) but not in the low-input group ($p=0.052$).

Correlation between text length and the number of all chunk tokens: In both October 2007 and May 2009, the high-input group shows a moderate to strong significant correlation between text length and the number of chunks in it (Pearson 0.612, $p<0.05$; 0.867, $p<0.001$); for the low-input group, this is the case only at the end of the study in May 2009 (Pearson 0.726, $p<0.05$).

Mean chunk length: In Oct 2007 there was no significant difference in the mean chunk length/text between the two groups. Over time, mean chunk length/text increased significantly in both groups (repeated measures ANOVA: $F(1,20)=74$, $p<0.001$, post hoc pair-wise comparison using paired t-test: high-input $p=0.000$, low-input $p=0.000$). In May 2009, the high-input group used significantly longer chunks (mean 3.13 words, $p<0.05$) than the low-input group (mean 2.60 words).

Proportion of chunk-words: In Oct 2007, the high-input group had a significantly higher percentage of chunk-words per text (mean 26.8 %, $p<0.05$) than the low-input group (mean 12.40%). Over time, the proportion of chunks increased significantly in both groups (repeated measures ANOVA: $F(1,20)=34$, $p<0.001$, post hoc pair-wise comparison using paired t-test: high-input $p=0.008$, low-input $p=0.000$). In May 2009, the high-input group had a significantly higher percentage of chunk-words per text (mean 45.60%, $p<0.05$) than the low-input group (mean 33.2%).

3.5. Results case study

Two learners were selected as representative of their groups (high and low-input), in the sense that their development matched most closely the chunk development at the level of their groups. Both learners were judged to be at the same starting level by a panel of independent judges. In this section we report on the results of the case study and in the Discussion section we explore the learners' development qualitatively from a dynamic usage-based perspective.

We also relate the results of the case study to the different input conditions and to the results of the group study.

3.5.1. Low-input learner

The longitudinal profile in Figure 3-7 shows the different chunk types identified in texts written by the low-input learner (texts collected from September 2007 to November 2009). Throughout the study, grammatical collocations such as particles (e.g. *at home*) and verb complements (e.g. *like –ing*) are the most frequent chunk types; in some texts these grammatical collocations are overused (see Figure 3-7, May 2009). The other two most frequently occurring chunk types are lexical collocations and compounds. After 2.5 years the learner used 6 chunk types compared to 3 chunk types at the start of the study. The correlation between the number of chunks and the length of the texts collected over time is rather weak and non-significant (Pearson 0.399, $p>0.05$).

3.5.2. High-input learner

Figure 3-8 illustrates the range of chunk types used by the high-input learner over time. Grammatical collocations (particles, e.g. *at home* and verb complements, e.g. *like –ing*) are the most frequent, followed by lexical collocations (e.g. *strong coffee*), conventionalized sentence stems (e.g. *One thing I know for sure is that* +clause) and structures (e.g. NUMBER *years old*). After 2.5 years the learner used 10 chunk types compared to 1 chunk type at the start of the study. The chunk range includes types with a communicative and discourse organisation function (e.g. *I mean; you know; by the way*). There is a strong, significant correlation between the number of chunks and the length of the texts collected over time (Pearson 0.947, $p<0.001$).

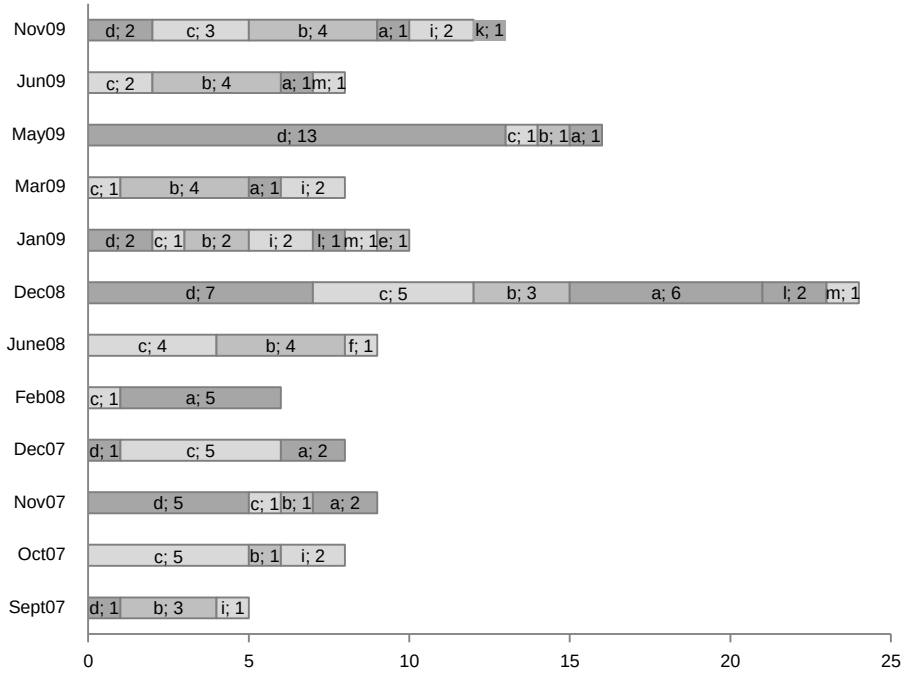


Figure 3-7: Longitudinal chunk profile in a low-input learner (raw token frequency). Numbers and letters in the bar chart indicate raw token frequencies of individual chunk types: a=compounds, b=lexical collocations, c=particles, d=complements, e=phrasal verbs, f=idioms, i=structures, k=constructions, l=conventionalized sentence stems, m=conventionalized sentences (chunk types are labeled alphabetically following Table 1 in Appendices).

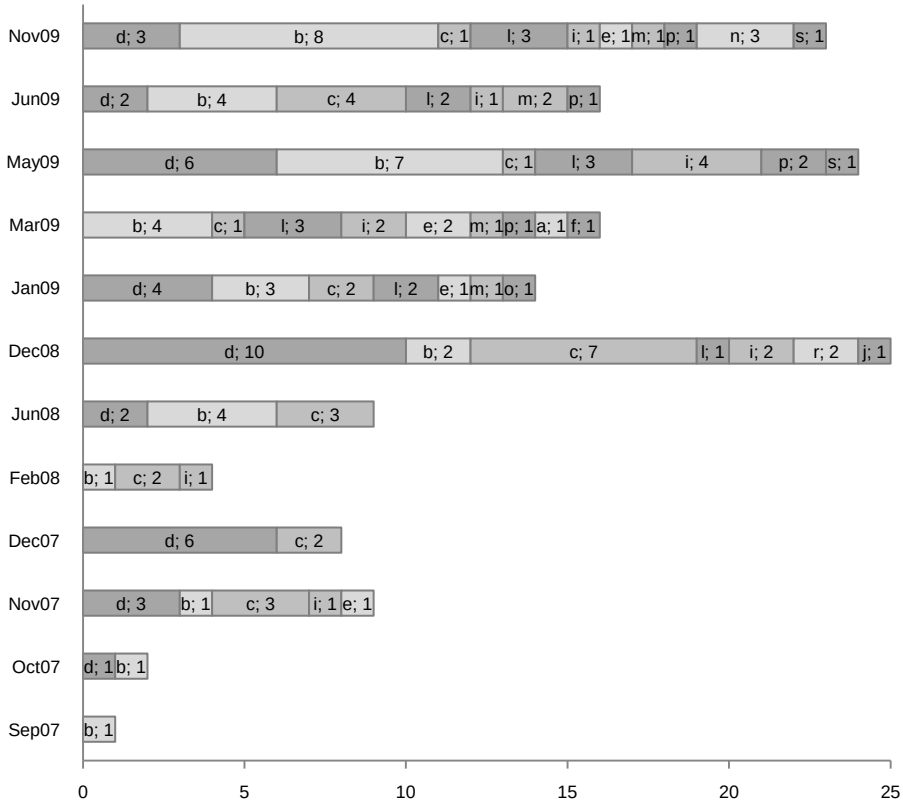


Figure 3-8: Longitudinal chunk profile in a high-input learner. Numbers and letters in the bar chart indicate raw token frequencies of individual chunk types: a=compounds, b=lexical collocations, c=particles, d=complements, e=phrasal verbs, f=idioms, i=structures, j=variable idioms, l=conventionalized sentence stems, m=conventionalized sentences, n=textual prepositions, o=textual conjunctions, p=textual adverbials, r=speech act formulae, s=attitudinal formulae (chunk types are labeled alphabetically following Table 1 in Appendices).

3.6. Discussion

3.6.1. Group study

The chunk measures we used in this study have helped tease out a number of significant tendencies in the development of the two groups. The results show that in both groups there is growth over time in all chunk measures. This is not surprising: since chunks are pervasive in language, both groups learn chunks as they learn other aspects of L2 English. However, there are differences in how much some of these measures increased in each group. We will discuss how these differences could be related to the amount and kind of input the learners were receiving. We will also discuss how the results of these measures are related and which measures seem to distinguish best the differences in development between the high and low-input learners. We will also illustrate the group tendencies with the results of the case study.

3.6.1.1. Raw frequencies

The raw frequency counts show that out of the 22 types established in our typology, 18 types were identified in the learner data, with considerable differences in frequency distribution between the different types (Figures 3-1 and 3-2 in the Results section). In general, the overall frequency distribution of chunk types appearing in the data at the start of the study was different than at the end of the study. In October 2007 of the most frequent chunk types were lexical collocations, particles, structures (short slot-fillers), compounds and complements. Most of these chunk types are short and/or grammatically based and tend to be very frequent in L2 English; they are also the ones most often encountered as part of language instruction. The use of these chunks contributes to L2 accuracy but not as much to general fluency and authenticity. Also, in October 2007 there were only very few "preferred ways of saying things", discourse organizers, communicative formulae and idiomatic chunks – the kind of chunks that greatly contribute to fluency and authenticity and are typical of an authentic native-like repertoire. Such findings indicate rather low levels of L2 proficiency at the start of the study.

As the overall use of chunks increased over time and the learners started using new chunk types, the frequency distribution of different chunk types changed. While the short and/or grammatically based chunks were still

very frequent, the order of frequency changed as "preferred ways of saying things", discourse organizers and communicative formulae were more frequently used: in May 2009, the most frequent were complements, lexical collocations, particles, conventionalized sentence stems, attitudinal formulae, compounds and conventionalized sentences. Such findings show that as the learners were becoming more proficient and had more contact with the language, they started using the longer chunks that greatly contribute to L2 fluency and authenticity. However, the results also show that some aspects of the frequency distribution and of the changes over time were not the same for both input groups.

3.6.1.2. Relative frequencies

The relative frequencies show that at the start (October 2007) the high-input group outperformed the low-input group on two chunk measures: %chunk-words/text and chunks/100 words. This means that in October 2007 the high-input group already used significantly more chunks, which could be related to the two months of semi-immersion in authentic input the group had already received at the time of the first writing (as opposed to the low-input group, who had received only 2 hours of English instruction weekly). At that point the high-input group was not using significantly more chunk types than the low-input group.

As the learners were becoming more proficient over time and started using more chunks, the relative measures grew in both input groups; however, there was a significant difference in the growth of two of these measures: the number of chunk types increased significantly more in the high-input group and chunks/100 words increased significantly more in the low-input group. In line with our expectations, the high-input learners developed a greater range of chunk types, since they had more exposure to authentic input. The significantly greater increase in chunks/100 words in the low-input group most likely indicates that there was a slight difference in L2 proficiency between the low-input and high-input learners at the time of the first writing. The progress in the low-input group was then more rapid because they started from lower (even zero) levels than the high-input group, who had already established a certain level of the L2.

The relative frequencies show that at the end of the study (May 2009) the high-input group again outperformed the low-input group, this time on three chunk measures. Firstly, the high-input group had a significantly higher proportion of chunks in their texts than the low-input group (%chunkwords/text). In fact, the high-input group had approached native-like proportion of chunks in their texts: on average, 46% of the learners' texts consisted of fixed chunks – quite close to Erman and Warren's (2000) estimation that about 50% of native speaker text consists of chunks; in the low-input group the average percentage was 33%.

Secondly, in May 2009 the high-input group used significantly longer chunks (mean chunk length/text) than the low-input group. This contributed to the increased percentage of chunk-words in text: since longer chunks contain more words, the percentage of chunk-words per text is higher. From a usage-based perspective, it is interesting to look at *why* the mean chunk length increased. The increased chunk length reflects our findings about the increase over time in certain chunk types: the high-input group increased their ratio of conventionalized sentence stems (e.g. *The only thing I know for sure is that* +clause) significantly more than the low-input group. In addition, the high-input group developed other types of longer chunks, such as textual sentence stems, attitudinal formulae and conventionalized sentences (e.g. *There are more important things in life*). It was mainly the increase in these "preferred ways of saying things" what contributed to the overall increase in chunk length.

What is also interesting about the longer chunks is that they are nested, i.e. consisting of smaller, often overlapping chunks. For instance, consider the example sentence in (1), which contains a conventionalized sentence stem *The only thing I know for sure* +clause. The stem consists of several overlapping word sequences, which in our study could all be considered chunks. As units, they all occur quite frequently in native-like use of English. For illustration see example (1) below, where the corresponding numbers show token frequency per 1 million words in COCA), with the frequency of occurrence decreasing with the increased length of the sequence.

(1) *The only thing I know for sure is that I want to travel.*

for sure	5706
know for sure	1161
the only thing	7796
the only thing I know	52
the only thing I know for sure	4

While all these sequences could in principle be also counted separately, in our study we only take into account the original 7-word sequence: it is a conventionalized way of expressing a certain notion (a normal way of saying this), which in its entirety can be regarded as a form/meaning/function mapping in Langacker's terms (2008b, p. 84). In a study of L2 development, the ability to use such expression seems a sign of fluency, authenticity and a certain proficiency in the L2. It also shows that the learner is paying attention to how things are normally said, or, to how individual words are combined into authentically sounding clauses and sentences, and finally into a fluent, native-like discourse (Ellis, 2001; Pawley & Syder, 1983). Since the use of these longer chunks is prominent in the high-input group, we can conclude that a) frequent exposure to authentic input facilitates the learning of longer chunks, b) that high-input learners develop sensitivity for „normal ways of saying things" and that, possibly, c) high-input learners are able to manipulate the L2 in larger form/function/meaning units and/or are able to recall longer word sequences.

Finally, in May 2009 learners in the high-input group used significantly more chunk types than the low-input group. This reflects the already mentioned use of discourse organizers, communicative formulae and above all "preferred ways of saying things" and is again in line with our expectations: more authentic input means a wider range of chunk types; more exposure to authentic input means greater opportunity to learn a wider range of chunk types.

However, in May 2009 the high-input group also wrote significantly longer texts, which could also influence their scores on some of these measures: longer texts increase the chance that more chunk types are used, and longer texts will logically contain more chunk tokens. Still, this is not entirely the case in our data: the length of a text and the number of chunks in it do not always correlate highly. Firstly, in October 2007 the low-input wrote significantly longer texts by almost a half than the high-input group; still, the high-input used significantly more chunks. Secondly, the high-input shows a strong significant correlation between text length and the number of chunks in it both at the start and at the end of the study; for the low-input group, this was only the case at the end of the study. These findings seem to suggest a different type of development in the two input groups: in native speaker repertoire we would also expect text length and number of chunks to correlate – since language is full of chunks, longer text will contain more chunk tokens. This finding could be a sign of more native-like development in the high-input group.

3.6.1.3. Individual differences

Our cross-sectional study has also revealed individual differences in the use of chunks, which we have noted not only in the statistical analyses (high standard deviations in almost all measures) but also in qualitative analyses of the data. Some of the chunks our learners use are not what one would expect in relation to the assigned topic, nor are they the kind that frequently appears in everyday language, in standardized corpora or in a classroom setting. Still, they are clearly chunks characteristic of the kind of input the learners are regularly exposed to. In an answer to a topic question (*What would you like to be when you grow up?*) two learners responded in very different ways – and used very different chunks. In the first example (1), we can detect the jargon of computer games, while in the second (2) we could guess at movies, TV shows and glossy magazines:

(1) *when i grow up i want to be a* ***game designer****. then i can make all kinds of games. i already use* ***game maker 7*** *where you can* ***program your own pictures****, you draw them with paint and then you can* ***let them appear or disappear*** *and you can* ***let them fire something or change into something else****. you can* ***make a sort of super mario*** *because you can* ***set the gravity and the jumping height****, but you can also* ***make a sort of pack man****, you just make a labyrinth and you* ***let your picture do what you want when you press certain buttons*** *and you* ***make other pictures follow you****. then you say that when a* ***collision*** *happens* ***between you and the guy****,* ***you delete yourself****. there are also programs that are used for making* ***3D pictures*** *and where you can* ***scan your drawings*** *to paste them on a way that you can* ***easily make them 3D.***

(2) *When I grow up,* ***I want to be famous, I want to be a star, I want to be in movies****. When I grow up,* ***I want to see the world****, I want to drive nice cars,* ***I want to have groupies****. When I grow up,* ***I want to be on TV****, that people know me, be in magazines. When I grow older than that, I want to have a nice, rich, husband that pays everything for me. I want to* ***do nothing at all and just lay around our pool all day long****. When I grow even older* ***I want to have children*** *and than* ***I hope I will be a good mom.*** *I will* ***make sure they get everything they need****, but I will not spoil them. I don't want to have* ***spoiled children****, but I do* ***want them to have a good life****. That is what I want to be when I grow up.*

In fact, the first few lines of learner text (2) almost exactly correspond with the chorus in a popular song which was traced back via WebCorp: *When I grow up / I wanna be famous / I wanna be a star / I wanna be in movies / When I grow up / I wanna see the world / Drive nice cars / I wanna have groupies / When I grow up / Be on TV / People know me / Be on magazines* ("When I grow up", The Pussycat Dolls, 2008). This is valuable evidence of the influence of input on the learner's use of L2 English.

In short, there are clear individual differences in what chunks learners use and how they use them, which can be related to different kinds of input they are exposed to. This is compatible with the usage-based assumption that everyone's experience of language is slightly different: what may be a completely unknown, highly idiomatic and perhaps a rather useless expression for one person (e.g. *super mario, pack man, set the gravity and the jumping height*) may be a frequently encountered and relevant expression for another. Compared to native speakers our Dutch L2 learners receive limited amounts of English input, and each learner may be surrounded by different kinds of input and developing their language in different ways. As a result, the developmental paths of chunks may be very different for each learner. The texts collected during our study provide evidence: some are more dense with chunks than others and the different chunk types are unevenly spread across the texts written by individual learners.

3.6.2. Case study

The longitudinal chunk profiles of the high and long-input learner (Figures 3-7 and 3-8 in the Results section) suggest qualitative differences in development. The high-input learner uses a range of different chunk types and shows considerable variability in the frequency distribution of chunk types over time, while in the low-input learner this variability is much less pronounced. At the start of the study the low-input learner used more chunks than the high-input learner (compare Figures 3-7 and 3-8, September 2007), but she seems to develop differently and does not experience the same rapid explosion of a wide range of chunk types as the high-input learner. The qualitative differences interpreted here at face value were further analyzed in Chapter 4 (Verspoor & Smiskova, 2012) where I argue that from a dynamic usage-based perspective

this difference in variability over time is meaningful and relevant to the learners' L2 development.

The profiles of the two learners also show different patterns in the development of specific chunk types. In the high-input learner, there are interesting relationships over time in the use of lexical collocations, grammatical collocations and "preferred ways of saying things". In the first half of the study she tended to overuse particles and verb complements, while using only a few lexical collocations; in the second half of the study her use of lexical collocations rapidly increased, she started using "preferred ways of saying things" and fewer grammatical collocations. This decrease could be explained by nesting: as the learner starts using longer and more complex conventionalized word sequences, shorter grammatical chunks embedded in them are no longer free-standing and consequently are not counted as such. For the low-input learner, grammatical collocations (verb complements and particles) remain the most frequent types throughout the study, the increase in lexical collocations is much less pronounced than in the high-input learner, and there is no clear emergence of "preferred ways of saying things".

The differing patterns of development can be related to the learners' different input conditions and illustrate in greater detail some of the significant effects identified on group level. The low-input learner, who had less exposure to authentic input, shows a rather limited development of different chunk types (from 3 chunk types to 6), while the high-input learner developed a whole range of different types (from 1 to 10). Next, while the low-input learner uses only very few "preferred ways of saying things", there is a clear emergence of this chunk type in the high-input learner: after 2.5 years, conventionalized sentence stems are the third most frequent chunk type in her text. The rapid increase in lexical collocations in the high-input learner matches the increase in raw token frequency on the group level (although this overall increase in the high-input group was not captured by the ratio type-token colloc/100 words). The high-input learner also uses communicative formulae and discourse organizers (textual and referential chunk types), both of which are an integral part of native-like discourse, while in the low-input learner these chunk types are missing. Finally, while the high-input learner shows a very strong significant correlation between the text length and the number of chunks, the low-input learner only shows a moderate trend, which is not significant. Just as on the group level, these findings seem to indicate a faster and more native-like development in the high-input learner.

3.7. Conclusion

In this study we explored the development of chunks from a usage-based perspective in two groups of Dutch L2 learners of English, one in a high- and one in a low-input condition. Using an integrated approach we have captured some significant differences in the development of each group over time. Our findings show that over time both groups used increasingly more chunks and developed a greater range of chunk types, among which were traditionally recognized types and so called "normal ways of saying things" (Langacker, 2008b); both groups also used increasingly longer chunks. Moreover, in line with our usage-based expectations, our findings also show significant differences between the two input groups. The high-input learners, who had more exposure to authentic input, developed a significantly greater range of chunk types including those with a clear discourse function, greater number of "normal ways of saying things" and a greater proportion of chunk-words per text. At the end of the study, this proportion was on average 46% - fairly close to Erman and Warren's (2000) estimate of about a 50% proportion of chunks in written native speaker text. Such findings lead to interesting conclusions that would benefit from further usage-based research. The significant differences we identified between the two groups are related to recognized features of a fluent, authentic native speaker repertoire: high chunk density, wide range of chunk types of various structure and function, longer and nested chunks. This suggests that the development of chunks in our high-input learners is more native-like than the development in our low-input learners; as a result, the high-input learners are also using their L2 in a more fluent and authentic way. Finally, we have also identified clear individual differences in what chunks the learners are using and how they are using them – this seems to be not only influenced by the amount and kind of input they are receiving, but also by their individual communicative needs.

Chapter 4

The dynamics of chunk development over time[13]

4.1. Introduction

Writing samples provide an excellent window into L2 development: they show active language use in all its facets such as the use of vocabulary, idioms, verb tenses, sentence constructions, errors, and so on. Moreover, in writing, more than in speaking, the learner can show better what he or she is capable of because writing allows for more reflection and is therefore usually somewhat more complex at both ideational and linguistic levels. An added bonus is that it is easier to collect and assess than spoken data.

The two sets of written texts below are from two students at the same school, of the same age, of similar scholastic aptitude, but in two different conditions: low input versus high input. Excerpts 1 and 3 are written by a low input student who attended a traditional high school program where English is taught on average two hours a week. Excerpts 2 and 4 are written by a high input student who attended a semi-immersion program in which half of all lessons (including history, math and science) for a total of about 15 hours a week are taught in English. About a month after they entered high school, they each wrote about their best holiday and towards the end of their second year about their favorite movie. In this chapter we will explore their language development, focusing on formulaic sequences, or "chunks" for short, which can be defined as conventionalized word combinations. The chunks have been bracketed in the text samples.

[13] This chapter is a slightly edited version of Verspoor, M. H., & Smiskova, H. (2012). Foreign Language Development from a Dynamic Usage-Based Perspective. In R. M. Manchon (Ed.), *L2 writing development: Multiple perspectives* (pp. 17-46). Mouton de Gruyter.

(1) *my best holiday are summer holidays. then you are six weaks free and then i [go on vacation] [to italy]. There I sleep everyday [till eleven o'clock]. I go everyday [to the swimmingpool] and [to the beach]. It's there very hot and it's everyday sunny. There is [delicious food] and it's a beatyfull land.*

(2) *In my Autumnholiday I maby go [to a hotel] in Germany or Belgian. I go to [one of] my favourite sports. That is horse-backriding. Maby I playing hockey [for fun]. I am going to Rita or Stella to logee.*

(3) *[there's one film I really like]. that's oceans 11. [it's about] a old thief who is [releasd from prision] and is going to [rob a casino] with [a couple of] guys. it are eleven guys and the old man [is called] mister ocean, so that is the reason of the title. there are all kind of guys, like a chinees one or a [bomb erpert]. the casino's are in [the greatest] play garden, las vegas. they are [going to] rob this casino's [on the night of] a big werstling game, so there is much money [in the save].*

(4) *Hi, I am Mary and [I'm going to tell you something about] a film or book I like. I have [a lot of] favourite books. Actually, I like all the books which are made for girls. But I have a favourite film. [It's called] 17 Again. Zac Efron is [the main character].[He's really hot!] [First], you learn to know a man, who's [fourty years old]. He is [not happy with the way] he ended [high school]. He could [get a scholarship] at a university, but he screwed his [basketball game], that was [because of] his girlfriend, who [told him that she was pregnant]. Then he [goes to] his [high school] and [because of] a [weird miracle], he becomes 17 again. [Of course], he [wants to] [get that scholarship] and make his life better than it was. But [at the end of the] film, he doesn't [want to] [get the scholarship] and he wants to stay with his wife. [Of course], there are [a lot more] details in this film, but [I can't tell them all], because it [doesn't fit in] the story!*

When we keep the difference in the amount of input in mind, it is not surprising to see that in the final product the high input student (excerpt 4) writes in a more fluent and authentic style than the low input learner (excerpt 3), and one of the reasons is probably that she makes more use of chunks.

Taking a dynamic usage-based (DUB) perspective, we assume that frequency of input (Ellis, 2002) is a crucial factor in language development, including the gradual use of chunks. Indeed, when we compare the number of chunks the low-input and high input groups produce at the end of the study, we see some significant differences. However, these numbers only tell us a small part of the story, and it is not until we trace two learners individually over time from a dynamic systems perspective that we see clear differences, not only in the number of chunks used at the end, but also in the acquisitional process leading to such use. Using Dynamic System Theory (DST) techniques and methodology, we show that development is not nice and smooth but variable. At one point, students may show a peak in chunk use, but the next time there is a dip again. In DST it is assumed that individual variability is a normal, essential part of development and that degrees of such variability may tell us something about the developmental phase L2 users are in. The chapter thus shows how a DST approach can illuminate language development, in general, and writing development in particular. The ultimate aim of the study is not only to shed more light on the process of chunk development in writing but also how we can capture this process.

In what follows, we first elaborate further on DUB theory and then present the study. The chapter finishes with implications for both research and teaching recommendations.

4.1.1. Dynamic usage based theory and L2 development

Dynamic usage-based (DUB) theory, a term suggested by Langacker (2000), holds that language is learned by experience. Langacker states that "language is learned through meaningful use, rather than being innate" (Langacker, 2009, p. 628). It is assumed that first and second language development is sensitive to many individual factors (such as the learner's attention, motivation, cognitive ability) as well as to external factors (such as the type and amount of meaningful input and interaction the learner has in the language). The major tenet is that language learners will gradually learn and acquire what they hear and use, and that they will learn and acquire first and best what they hear and use most (Ellis, 2002). Therefore, all other things being equal, frequency of input and use are a major factor in language acquisition. One outcome of frequent input is "entrenchment": the more often a unit is repeated, the more its memory trace is stabilized in the mind and the easier it is to retrieve and use it.

A unit, also called "a construction" in DUB theory, can be any meaningful utterance of varying degrees of concreteness or length. For example, a single word such as *dog*, a compound such as *doghouse* or an idiomatic expression such as *he is in the doghouse* (which means that someone, usually a husband, has done something to anger someone else, usually his wife, so that she figuratively locks him out of the house and lets him sleep in the doghouse) are all constructions of different lengths. It is possible that an L2 learner learns the expression as a whole or in parts. Whereas both routes to learning this particular expression are theoretically possible, the second route is more likely because most probably a learner is more frequently exposed to the individual words and the schematic construction X *is in* Y than to the specific construction *he is in the doghouse*. However, for other constructions the opposite may be the case. One can imagine that L2 learners may learn very frequent specific constructions such as *How are you?* and *Fine, thank you, and you?* as one chunk before they have discovered the meanings of each word separately and used a more schematic construction such as *how* BE X. Nick Ellis (2001) suggests that success in language learning may actually depend on whether an individual can perceive and remember such sequences well. He argues that if they are stored in long-term memory, chunks may promote grammar learning because they can later be analyzed into smaller parts. He even suggests that differences in the ability to remember word strings may be related to different rates of success in gaining proficiency in the language as a whole.

To summarize, learners can learn constructions of different lengths in different ways, depending on various factors such as their ability to remember strings, their own level of proficiency in the L2, and on how frequently the specific construction is used in their presence. In particular, learners may learn chunks in different ways, depending on the relative frequencies of the schematic construction (type frequency) versus the specific construction (token frequency, the chunk) (Ellis & Ferreira-Junior, 2009a).

DUB theory also holds that language (or grammar) is emergent: it develops in complex, active, adaptive ways (Ellis, 2008b). A language like English does not consist of fixed forms; rather, it emerges because in personal relations, speakers interact using both their past experiences and their present perception of these forms (Hopper, 1998, p. 156). Moreover, a person's second language changes continually as a learner receives more input. The changes and mechanisms of this process of L2 acquisition can be further explored by taking a Dynamic Systems Theory (DST) approach.

DST is a general theory of change in complex systems. A complex system is any system (e.g., the economy, the weather, traffic) that has different parts or subsystems, which are all interconnected and continually interact. When one part of the system changes, it will affect all other parts of the system to different degrees. DST is in line with DUB theory "because of the complete interconnectedness of the subsystems both in the mind and in the linguistic system, and because of the assumed dependency on both internal and external resources, such as perception, cognition, conceptualization, and human interaction" (Verspoor & Behrens, 2011). Language, from a DST perspective, consists of a number of interacting subsystems, "none of which will be completely stable during any length of time" (Verspoor, Lowie, & van Dijk, 2008, p. 215). Moments of instability are referred to as "variability".

According to DST, the degree of variability is greatest during periods of rapid development when the learner explores and tries out new strategies or modes of behavior, which may or may not be successful (Thelen & Smith, 1994). The idea is that systems have to become unstable before they can change. In other words, at a moment of change there seems to be a state of chaos. The cause and effect relationship between variability and change is not one-sided but considered to be reciprocal. In development, the learner must discover, try out and practice each part of the process him or herself, and this is accompanied by a great deal of trial and error, resulting in variability. On the one hand, this variability permits flexible and adaptive behavior and is a prerequisite to development; on the other hand, free exploration of performance generates variability. To summarize, "variability", a term we have used to refer to variation in performance within one individual, is assumed to be functional in that it drives development. For the second language researcher, variability is interesting to study because it can show when and how different subsystems of a learner's language change. For the second language teacher it is important to be aware of the fact that when learners first try out new constructions, they may be very inconsistent and there is a great chance there will be errors: errors are not a sign of bad teaching but a sign of good learning.

Another implication of a DUB approach to language acquisition is "variation", a term we will use to refer to differences at the group or population level. In DUB theory, there is no "language switch" to be turned on, but each individual has to experience, discover and practice the language on his or her own: "Each individual is considered a dynamic system whose progress is best predicted by this individual's prior experience" (Behrens, 2009, p. 392). Because

individuals will not have exactly the same experience in life, their development will not be exactly alike. In second language acquisition, we know that many variables such as the L1, aptitude, motivation, and willingness to communicate may have an effect on L2 development. For example, if the L1 and L2 are similar, the L2 will be easier to learn (Bybee, 2008). But even when many variables are controlled for, we find many individual differences. As Van Dijk, Verspoor, and Lowie (2011) show, none of the six Spanish learners of English as a second language whose development of negative constructions was traced for 10 months matched the "average" curve. For the second language researcher, it is important to be aware of variation: even though there are common patterns, not every learner will behave in the same manner in all respects. For the second language teacher, it is useful to be aware of the possible variation among learners and offer a variety of instructional modes so that different types of learners may benefit.

DUB is a relevant theory for the exploration of L2 writing development giving its emphasis on both the role of the individual and the variability in development, making variation - due to the many individual trajectories possible - a normality rather than an aberration. The theory allows us to look beyond group statistics and amalgamated results in an attempt to discover the process learners go through in their mastery of new skills.

4.1.2. Chunks and L2 development

As Verspoor, Schmid, & Xu (2012) have shown, the use of chunks provides one of the most robust measures in proficiency development. This is not surprising considering the fact that native speakers use chunks abundantly.

> Phraseological analyses demonstrate that much of communication makes use of fixed expressions memorized as formulaic chunks, that language is rich in collocational and colligation restrictions and semantic prosodies, that the phrase is the basic level of language representation where form and meaning meet with greatest reliability, that formulaic sequences play a central role in child language acquisition, and that fluent language users have a vast repertoire of memorized language sequences (Ellis, 2008, p. 6).

Langacker (2008b) further points out that these sequences can range from standard collocations to large chunks of boilerplate language. They can be either fully specific and fixed or partially schematic and allow slot-filling in certain positions. The richness of collocational and colligation restrictions is reflected in the many types of chunks discussed and in the definitions given in the literature. However, as Granger & Paquot (2008) make clear, formulaic sequences are difficult to define and classify: they may be word combinations whose internal structure may or may not be regular and which may or may not fit predefined linguistic categories. They may have different syntactic forms, ranging from complete sentences to clauses or phrases. They may have different degrees of semantic compositionality, which refers to the extent to which the meanings of the individual parts contribute to the meaning of the expression as a whole. And finally they can have different functions. In our study, we have taken the native and near-native speakers of English and their conventionalized use of the language as our reference, including expressions or "normal ways of saying things" that native speakers may use (Langacker, 2008, p. 84). We operationalized chunks as follows:

> a combination of two or more words expressing an idea (concept) in a particular context in a grammatically correct way, which is an authentic, native-like way of expressing that idea (Chapter 3; Smiskova & Verspoor, in press)

Table 4-1 briefly presents the 20 types of chunks, originally based on Granger and Paquot (Chapter 3; Smiskova & Verspoor, in press; for a detailed typology see Table 1 in Appendices), which we identified in our students' writings with examples to illustrate.

Table 4-1: Chunk types arranged according to function identified in our students' writing samples (based on Granger & Paquot, 2008).

CHUNK TYPES WITH A REFERENTIAL FUNCTION	
Compounds	*sunbathing, dressing rooms, deep blue, forest fire, after sun cream, two-week holiday, ice-cream*
Lexical collocations	*heavy rain, closely linked, apologize profusely; the sun goes down, take a dive, strong current, pretty hard, real close, went wrong, hurt badly*
Particles	*aim at, afraid of, involved in, at school, in English*
Complements	*avoid –ing; necessary to; want/going/have/ manage to; go –in; keep –ing; would like to; be able to; know+clause; say that+clause*
Phrasal verbs	*blow up, make out, crop up*
Idioms	*to spill the beans, to let the cat out of the bag, to bark up the wrong tree*
Similes	*as old as the hills, to swear like a trooper*
Irreversible bi- and trinomials	*bed and breakfast; kith and kin; left, right and centre*
Structures	*even* ADJ+*er than*; *as* ADJ *as, it is* easy *to do, a* year *ago, two meters high, so happy that*
Variable idioms	*think nothing of –ing; pay a price for –ing; end up –ing*
Constructions	*The sooner we are finished, the sooner we can go*
Conventionalized sentence stems	*one thing I know for sure is…; all they can do is…*
Conventionalized sentences	*It`s hard to explain. I`m just who I am. I (really) like her as a friend.*
CHUNK TYPES WITH A TEXTUAL FUNCTION	
Textual Prepositions	*with respect to, in addition to, apart from, irrespective of*
Textual Conjunctions	*so that, as if, even though, as soon as, given that*
Textual Adverbs	*in other words, last but not least, more accurately, what is more, to conclude, the reason for, however*
Textual sentence stems	*the final point is …; another thing is …; it will be shown that …; I will discuss ...;*
CHUNK TYPES WITH A COMMUNICATIVE FUNCTION	
Speech act formulae	*good morning; take care; you`re welcome;* suggesting (*why don't we*), concluding (*that's all)*
Attitudinal formulae and sentence stems	*in fact, to be honest, it is clear that, I think that…*
Commonplaces	*it`s a small world; we only live once; the sky is the limit*

The types of chunks in Table 4-1 are arranged according to their functions (referential, textual and communicative) and do not necessarily reflect any

developmental principles. For L2 development, one would expect that the shorter the chunks are easier to remember and acquire. Also, fully fixed chunks are unique and just as lexical items they have to be remembered one by one, whereas partially schematic chunks have one or more slots to be filled and can therefore become productive. Once they have been learned, they can be used over and over again. Because we expect differences in the developmental paths of these two types of chunks we have grouped them as *fully specific and fixed chunks* and *partially schematic chunks.*

Table 4-2: Fully specific versus partially schematic chunks.

FULLY SPECIFIC CHUNKS	PARTIALLY SCHEMATIC CHUNKS
lexical collocations	complements
particles	structures
compounds	constructions
phrasal verbs	conventionalized sentence stems
textual adverbials	conventionalized sentences
textual conjunctions	attitudinal formulae & sentence stems
speech act formulae	textual sentence stems
idioms	
variable idioms	
bi- and trinominals	
commonplaces	

To summarize, chunks are combinations of words that native speakers use abundantly and that L2 learners must acquire to sound more proficient and native-like. If we assume that frequency of use is one of the greatest factors in L2 development, we can expect chunks to be acquired more slowly than individual words because fixed combinations of words are by nature less frequent than separate words. We can also assume that the shorter the chunk or the more frequent the chunk, the sooner it will be used by our learners.

4.2. The study

The study reported on here is part of a larger study examining the effects of low input and high input conditions (cf. Verspoor et al., 2010) and a project comparing language development of L2 learners cross-sectionally (cf. Verspoor, Schmid, & Xu, 2012) and longitudinally. In this study, we will focus on the longitudinal development of chunks in two conditions: low input and high input.

4.2.1. Rationale

In language development all kinds of subsystems -such as the lexis, and the syntax- will develop, each again with their own subsystems. Each of these would be interesting to follow. In this study, however, we focus on "formulaic sequences" or "chunks", which occur quite frequently in the language of English native speakers and must be acquired by the learner to sound fluent and native like. Chunks are particularly interesting because Eyckmans, Boers, & Stengers (2007) argue that classroom-based language learning cannot "provide sufficient opportunities for learners to build a phrasal repertoire that could in anyway come close to the size of a native speaker's" (p. 2). Classroom materials and textbooks do provide the learner with useful word-strings, which they can learn by heart, although, according to Wray (2008), learners have the tendency to home in on the individual words, instead of the phrase, throwing away all the important information that the context provides (Wray, 2008, p. 206). To test these assumptions, we will compare two types of learners, those in a low input condition (regular instructional setting with about two hours a week of English) and a high input condition (bilingual setting with about 15 hours a week of English). The type of instruction is important because in the high input condition, learners are expected to be exposed to and use chunks more frequently than in the low-input condition.

4.2.2. Aims and research questions

The aim of the study is to explore language development, in particular the development of chunks, through L2 writing samples. By taking a DST approach and examining the variability in individual trajectories, we hope to capture the actual developmental process. Taking a DUB perspective, we will assume that there are two main principle factors at play that may not be mutually exclusive: the frequency of occurrence of the chunk as a whole and the total length of the chunk. Compared to their low-input counterparts, we expect our high input learners to use more chunks sooner, not only in number of tokens but also in number of types. Another factor that may be involved is whether the chunks are fully fixed and have to be learned one at the time or partially schematic and can become productive once acquired. The fully fixed ones are expected to develop rather steadily (without a clear jump) and the partially schematic ones are expected to show a clear jump.

The research questions for the group study are as follows:

1. Are frequent chunks used before less frequent ones?
2. Are short chunks used before longer ones?
3. Do high input learners use more chunks than their low input counterparts?

The research questions for the two case studies are as follows:

4. Do fully fixed chunks show a developmental pattern with jumps?
5. Do partially schematic chunks show a developmental pattern with jumps?
6. Do high input learners use more chunk types than their low input counterparts?
7. Do high input learners learn chunks in the same sequence as low input learners?

4.3. Method

We collected informal written texts from both high- and low-input group at the start (October 2007) and towards the end of the study (May 2009)[14] and totaled the counts (tokens) of all chunk types identified in the texts. Students were asked to write on informal topics. The collected texts were analyzed and hand-coded for the different types of chunks shown in Table 1 using researcher intuition, supported by computerized searches of reference corpora. To obtain a general view of differences between the two conditions, we identified and classified all chunks used by all learners in both groups in the first and last writing assignments, and calculated for each type of chunk the ratio of chunks per 100 words.

To discover developmental patterns in the different conditions, we traced the development of chunk use in two individual, rather average learners (whose first and last texts were shown in the Introduction). For each learner, we calculated the total number of chunks and the total number of types of chunks per text. The longitudinal profiles of these individual learners were examined for patterns of variability in the development of different chunk types and in the developmental interactions between different chunk types.

[14] Due to subject dropout we had to take May 2009 as the end-point to our longitudinal group study; for our two case studies, the data was available until November 2009.

4.3.1. Participants

The participants of the group study were twenty-two high school students with similar socio-economic backgrounds, scholastic aptitude, and interest in learning languages. These students had a high scholastic aptitude as determined by the Dutch CITO test, which most children take around age 11 or 12. They were enrolled in the highest Dutch school type: gymnasium or the VWO-English semi-immersion program. The gymnasium students attended a regular program with 2 hours of English with a non-native speaker of English and 2 hours of Latin. At the end of the study, they had had approximately 220 hours of instruction in English. They are referred to as the low input group. The VWO-English immersion students attended a program with 15 hours a week of English, about five of which by a native speaker of English. At the end of the study they had had approximately a total of 1320 hours of exposure and instruction in English. They are referred to as the high input group. The students were similar in many respects, even in their interest in languages, but they differed in the amount of exposure to English.

For the study on individual trajectories we selected from each group an average learner who started at about the same level. Neither of them belonged to the strongest or weakest language learners in the class.

4.3.2. Data sources

The two groups of learners were asked to write short texts on informal topics such as "My vacation" over a period of about 2 years. The first texts were written in October 2007, about six weeks after school had started. This means that the low input group had received about 10 hours of English instruction at that time, compared to about 60 to 80 hours of English exposure the high input group had had. This might explain some differences found at the beginning of the study. These texts were collected in class with the help of the teacher. We were able to collect more texts written by the high input learners (on average 18 texts) than by the low input learners (on average 11 texts).

4.4. Results

The first section will first show the group analyses (research question 1-3) and the second one the analyses of the individual trajectories (research questions 4 - 7).

4.4.1. Group data analyses

Table 4-3 shows the average ratio of each chunk type per 100 words of text used by the low input group and high input group at the beginning of the study and at the end of the study. The data is presented twice in two columns. In the column "differences over time" the groups are compared to themselves. In the column "compare groups", the two groups are compared to each other. For ease of reference, significant differences have been boldfaced and highlighted.

Table 4-3: Average ratio of each chunk type per 100 words of text used by the low-input group and the high-input group in October 2007 and May 2009. (Note: *significant at the 0.05 level; **significant at the 0.001 level).

CHUNK TYPES	DIFFERENCES OVER TIME				COMPARE GROUPS			
	LOW		HIGH		Oct07		May09	
	Oct07	May09	Oct07	May09	LOW	HIGH	LOW	HIGH
lexical collocations	1,15	**4,02***	2,62	3,26	1,15	**2,62***	4,02	3,26
complements	0,26	**4,75***	1,16	**3,15***	0,26	1,16	4,75	3,15
conv. sentence stems	0,05	**0,56***	0,25	**2,07****	0,05	**0,25***	0,56	**2,07***
particles	1,14	1,26	2,16	1,71	1,14	2,16	1,26	1,71
attitudinal formulae & sent. stems	0	0,59	0,11	1,19	0	0,11	0,59	1,19
compounds	0,58	0,52	1,77	0,68	0,58	1,77	0,52	0,68
conv. sentences	0	0,43	0,76	0,57	0	0,76	0,43	0,57
constructions	0,05	0	0	0,37	0,05	0	0	0,37
phrasal verbs	0,24	0,07	0,12	0,29	0,24	0,12	0,07	0,29
structures	**1,11***	0,08	**1,19***	0,19	1,11	1,19	0,08	0,19
textual adverbials	0	0,08	0,13	0,23	0	0,13	0,08	0,23
textual conjunctions	0	0,06	0	0,1	0	0	0,06	0,1
speech act formulae	0,14	0,06	0,13	0,19	0,14	0,13	0,06	0,19
textual sentence stems	0,05	0	0	0,05	0,05	0	0	0,05
idioms	0	0	0	0,05	0	0	0	0,05
variable idioms	0,12	0	0	0,13	0,12	0	0	0,13
bi- and trinominals	0,09	0,13	0,23	0,07	0,09	0,23	0,13	0,07
commonplaces	0	0,06	0	0,07	0	0	0,06	0,07
TOTAL	4,98	12,68	10,62	14,37	4,98	10,62	12,68	14,37

Among the 18 different chunk types, a repeated measures ANOVA shows significant increase over time for both groups in three chunk types: lexical collocations ($F(1,20)=10$; $p<0.05$), complements ($F(1,20)=32$; $p<0.001$) and

conventionalized sentence stems ($F(1,20)=33$; $p<0.001$). Moreover, the conventionalized sentence stems ratio ($F(1,20)=10$; $p<0.05$) showed a significantly greater increase over time in the high-input group, while the complements ratio ($F(1,20)=5$; $p<0.05$) showed a significantly greater increase over time in the low-input group. When we compare the groups to each other (Table 4-3: Compare groups), we see that the high input learners already use more lexical collocations and conventionalized sentence stems at the start, which is probably due to the fact that they had already been exposed to about 90 hours of English at the time the first test took place. At the end, the high input learners use about four times as many conventionalized sentence stems as their low input learners. This is the type of chunk with the greatest difference between the two groups.

To see what types of chunks the different groups used at the end of the study, Tables 4-4 and 4-5 show the data arranged in order of frequency of use in May 2009 for each group separately. The fully fixed and partially schematic chunks are presented in separate columns.

Table 4-4: Group of low input learners: chunks arranged according to frequency of use. The numbers show ratio per 100 words.

Group of low input learners May 2009			
Fully fixed chunks		**Partially schematic chunks**	
lexical collocations	4,02	complements	4,75
particles	1,26	attitudinal formulae & sent. stems	0,59
compounds	0,52	conventionalized sentence stems	0,56
bi- and trinominals	0,13	conventionalized sentences	0,43
textual adverbials	0,08	structures	0,08
phrasal verbs	0,07	constructions	0
textual conjunctions	0,06	textual sentence stems	0
commonplaces	0,06		
speech act formulae	0,06		
idioms	0		
variable idioms	0		

Table 4-4 shows that as far as the fully fixed chunks are concerned, the low input learners behave as expected. They make relatively more use of the short, frequent types of chunk, s such as lexical collocations, particles and compounds. The relatively infrequent use of phrasal verbs is somewhat surprising. As far as the partially schematic chunks are concerned, the low input learners do not quite behave as expected, because structures and constructions, which may have been taught and learned in class, are hardly used. Even though the ratios

are still low, these learners use relatively more attitudinal formulae and sentence stems, conventionalized sentence stems, and conventionalized sentences than expected.

Table 4-5: High input learners: chunks arranged according to frequency of use. The numbers show ratio per 100 words.

Group of high input learners May 2009			
Fully fixed chunks		**Partially schematic chunks**	
Lexical Collocations	3,26	Complements	3,15
Particles	1,71	Conventionalized sentence stems	**2,07**
Compounds	0,68	Attitudinal formulae and sentence stems	1,19
Bi and trinominals	0,29	Conventionalized sentences	0,57
Textual Adverbials	0,23	Constructions	0,37
Textual conjunctions	0,19		
Speech act formulae	0,13	Structures	0,19
Phrasal Verbs	0,1	Textual sentence stems	0,05
Idioms	0,07		
Variable idioms	0,07		
Commonplaces	0,05		

Table 4-5 shows that as far as the fully fixed chunks are concerned, the high input learners also behave as expected. Just like their low input counterparts, they use lexical collocations, particles and compounds the most. The frequency of use for these chunks is exactly the same as that of their low input counterparts for the first five chunk types. They use the short, frequent types of chunks such lexical collocations, particles and compounds relatively more. The relatively infrequent use of phrasal verbs is again somewhat surprising. The high input learners use the remainder of the fully fixed chunks slightly more and in a slightly different order.

As far as the partially schematic chunks are concerned, there is a clear difference in order. Like their low input counterparts, they use complements the most, although followed by conventionalized sentence stems. Also they use several types of constructions more frequently, but these differences are not significant. However, as mentioned earlier, for conventionalized sentence stems there was a significant difference between the groups.

4.4.2. Analyses of individual trajectories

The group effect shows one significant difference in conventionalized sentence stems, which does not seem to capture nor do justice to differences we found in the writing samples at the end of the study between our two example learners. Moreover, it does not tell us anything about the actual developmental process. To do so, we will trace chunk development of the two individuals whose texts were shown in the introduction. Note that we have fewer samples for our low input learner.

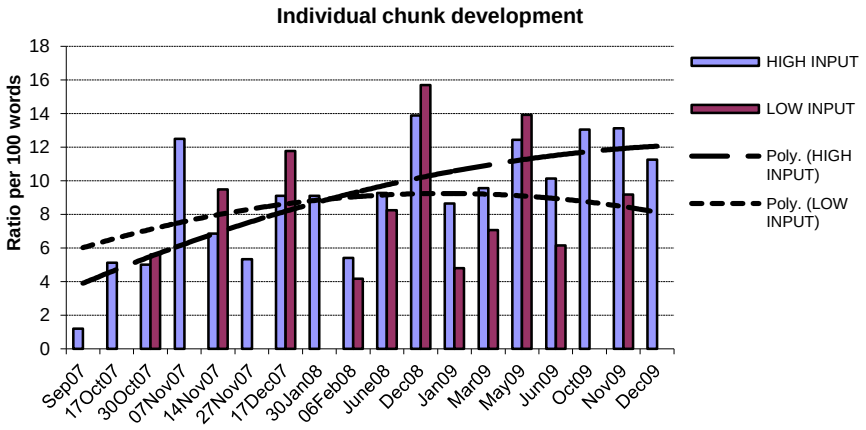


Figure 4-1: Chunk development in tokens of one high input and one low input learner over time.

When we trace the chunk use by the two individuals over time (Figure 4-1), we see variability in both learners. Neither of the two shows a steady increase in chunk use. Both show peaks and dips. The trend line (a polynomial to the 2nd degree) shows an upward movement for the high input learner and a slight convex for the low input learner, but when we look at their common data points, they actually correlate rather highly (r 0,71; Pearson correlation significant at 0.05 level). However at first glance, it looks as if the high input learner stabilizes somewhat during the last four data points, a finding we will

examine further in a moving correlation and min-max graphs[15]. A moving correlation is a correlation over the first three data points (1-3), followed by a correlation starting at the second data point (2-4), the third data point (3-5) and so on. It shows how the trajectories correlate locally during the process. The moving correlation (Figure 4-2) shows that the learners seem to develop quite similarly, with a slight divergence around February 2008 and quite a strong divergence at the end.

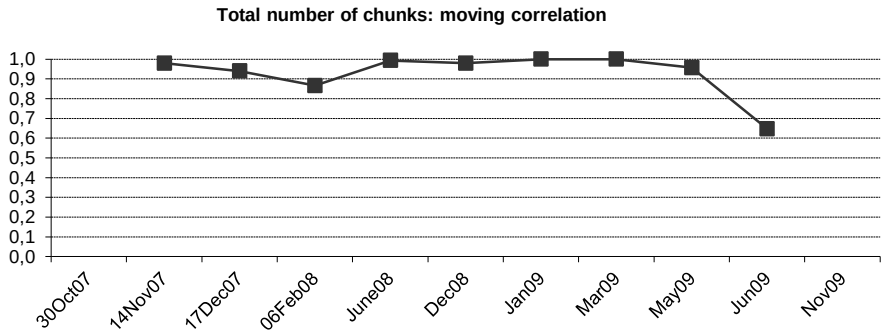


Figure 4-2: A moving correlation (window of three data points) of chunks use by a high input and a low input learner.

To be able to discover what is happening, we will look at the individual learners separately in min-max graphs. Min-max graphs are purely descriptive ways of visualizing the degree of variability and are meant to highlight only the patterns found. The top line shows the maximum and the bottom line the minimum, and just as in a moving window of correlation, they show the average maximum or minimum over three consecutive data points. Some degree of variability is normal, even if a rather stable stage has been reached. However, we expect jumps between two distinct stages, often accompanied by a higher degree of variability right before the new stage has been reached.

[15] For detailed explanations, motivation and instructions on the methods and techniques used in the subsequent variability analyses, we refer the reader to Verspoor, de Bot & Lowie, 2011).

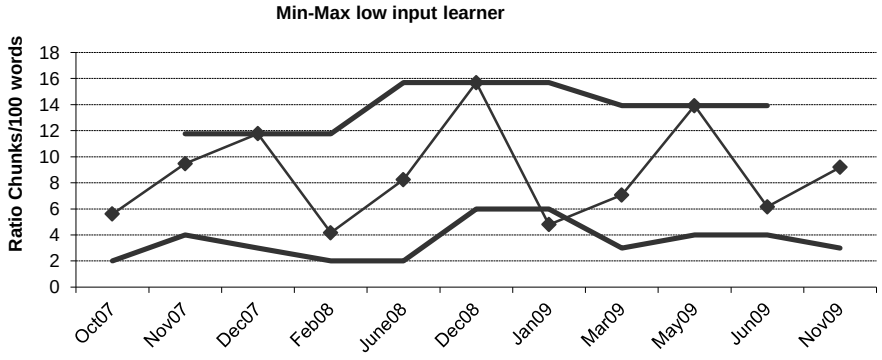


Figure 4-3: Min–max graph of the low input learner's chunk use.

Figure 4-3 shows the low-input learner's chunk development. There is definitely a rather high degree of variability, but the min-max lines show that the bandwidth of variability does not change to any great extent over time, suggesting that no jumps are made to a new stage.

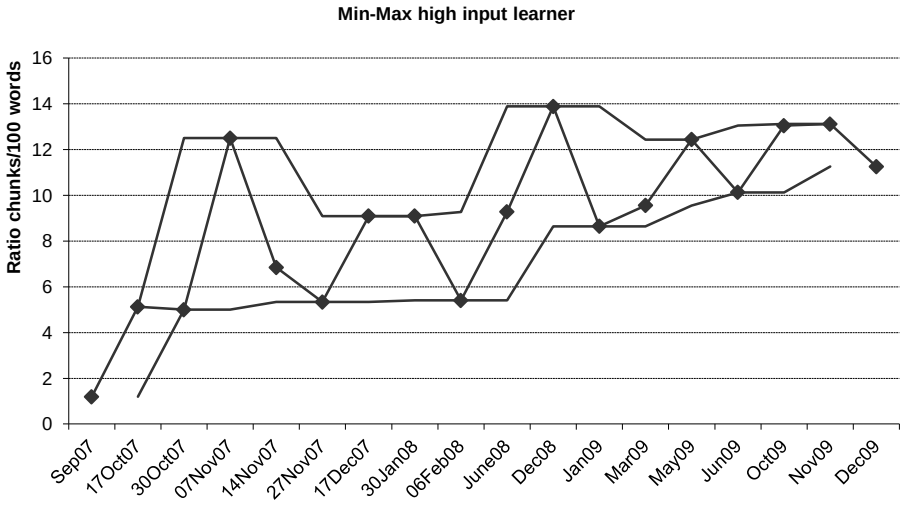


Figure 4-4: Min–max graph of the high input learner's chunk use.

Figure 4-4 shows the high-input learner's chunk development. Here too there is a degree of variability all along, but the min-max lines clearly shows developmental phases: one from 14 November 2007 to June 2008, preceded by a peak on 7 November 2007, then there is another widening of the band with a peak in December 2008, followed by a time period in which the bandwidth becomes narrower around May 2009. This narrow band indicates a rather stable stage, when variability is more limited.

Figures 4-3 and 4-4 have examined the total number of chunks, but not the types of chunks. From our typology originally containing 22 types 18 different types were used by these two learners. In the following figures, we examine the types of chunks used per text by each of our learners, again adjusted for text length. Figure 4-5 shows the total number of different types used. Note that we show only the texts that the two learners have in common.

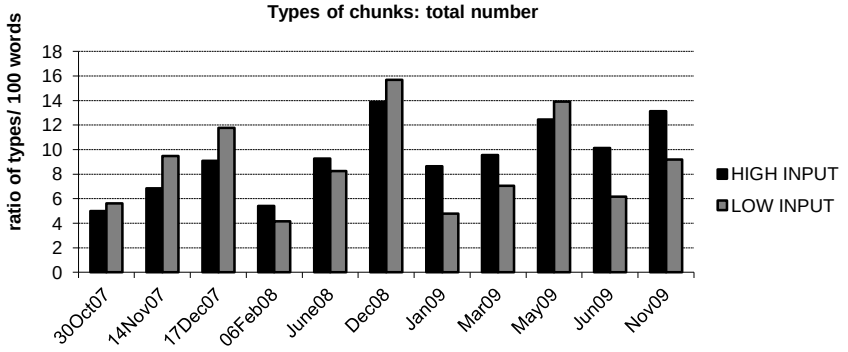


Figure 4-5: Chunk development in types of the high input and the low input learner over time.

Figure 4-5 shows that initially our high input learner actually uses fewer chunk types than her low input counterpart, but things change after December 2008, when the roles are turned around. To make the general patterns more visible and neutralize incidental peaks, we created a line graph with a moving average over 2 data points as a trend line in Figure 4-6.

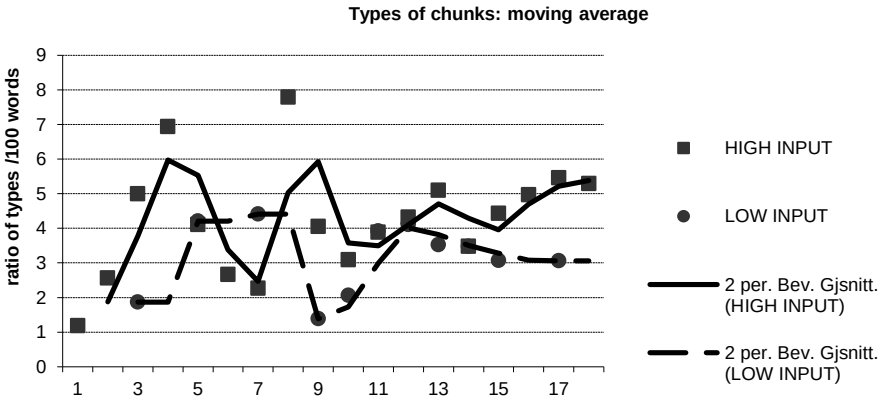


Figure 4-6: Chunk type development of one high input and one low input learner over time with a moving average over two data points.

Figure 4-6 shows that our high input learner shows a great degree of variability with two rather distinct peaks around data points 4 and 9, but from around data point 15, the types seem to have stabilized and increase slightly. The low input learner seems to have fewer extreme peaks and even the number of chunk types seems to decrease after data point 12, also suggesting some degree of stabilization, but at a lower level than our high input learner.

We have seen now that especially at the end of the study the high input learner uses more different kinds of chunks. We would now like to see if we can find any particular patterns in the types. To make visualization and patterns more visible we will use our two more general categories: fully fixed chunks and partially schematic chunks.

Figures 4-7 and 4-8 show the number of different fully fixed chunks used by our learners.

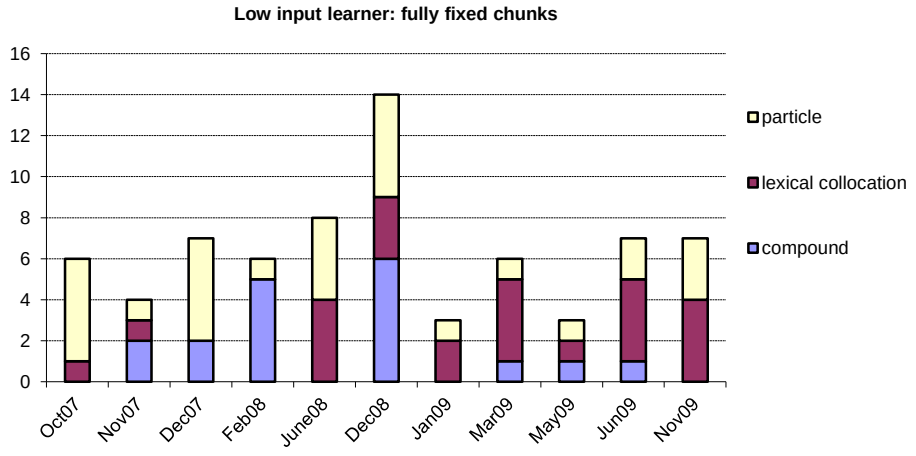


Figure 4-7: Development in fully fixed chunk types of the low input learner over time.

Figure 4-7 shows that our low input learner uses three types of chunks, particles, lexical collocations and compounds to varying degrees over the course of the two years. There is no discernible developmental pattern.

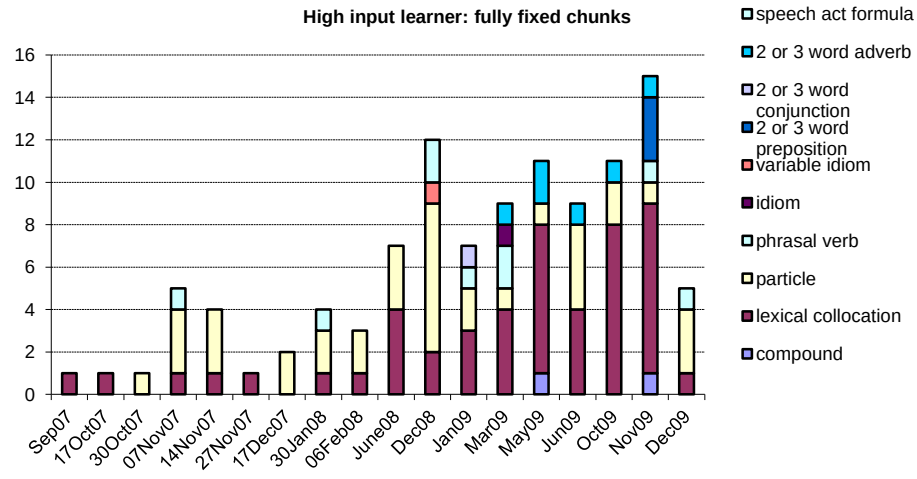


Figure 4-8: Development in fully fixed chunk types of one high input learner over time.

Figure 4-8 shows that the high input learner starts off rather slowly during the first year with two or three different types per text, but by December 2008 she shows a jump, not only with more chunks but also different types. This trend continues until November 2009, after which the lexical chunk use shows a dip.

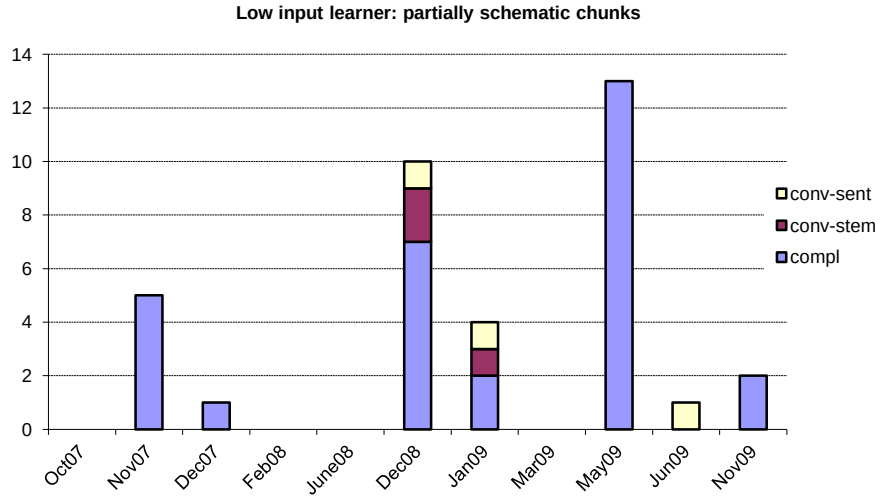


Figure 4-9: Development in partially schematic chunk types of one low input learner over time.

Figure 4-9 shows that the low input learner uses three partially schematic chunks: complements, conventionalized sentences and conventionalized sentence items. There is no discernible pattern of development.

The high input learner (Figure 4-10), like her low input counterpart, does not show any clear signs of development until about June 2008, even though she tries out more different kinds. She starts off with complements, an odd conventionalized sentence, and structures. In December 2008 there is a peak in the use of complements, a typical sign of overuse, after which the five different kinds of partially schematic chunks are used. By October 2009, a range of partially schematic chunks has appeared.

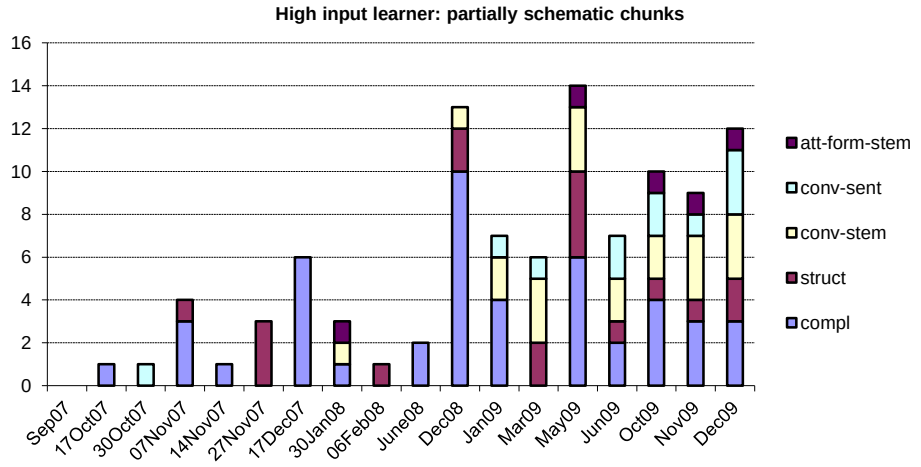


Figure 4-10: Development in partially schematic chunk types of one high input learner over time.

To see if there are differences in developmental patterns between fully fixed and partially schematic chunks, we created line graphs for the two types. Figure 4-11 shows that both types of chunks show rather random peaks and dips, which is also evident from the very low correlation (r 0,049491), indicating there is no discernible pattern of development here. Figure 4-12 shows that after February 2008 the two types of chunks seem to develop simultaneously, both with a clear jump around December 2008, which is supported by a rather high overall correlation (0,75).

Over time, however, the relationship also seems to change: until February 08 the interactional pattern is more random and at the very end their path seems to separate, but with only one such data point it is impossible to draw any conclusions. When we compare the two learners to each other, it seems that both the low input learner and the high input learner went through a rather random pattern. The low input learner keeps this random pattern until the end of the study. The high input learner, however, has a different pattern after February 2008 (indicated with an oval in Figure 4-12).

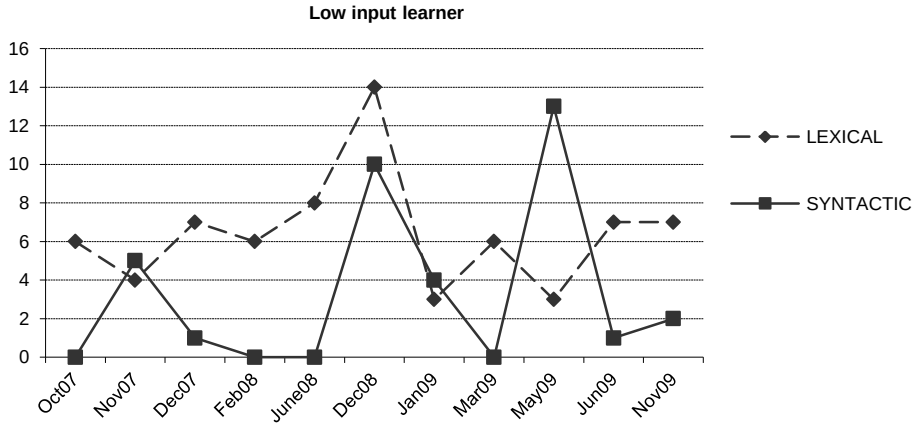


Figure 4-11: Interaction of fully fixed and partially schematic chunks in the low input learner over time.

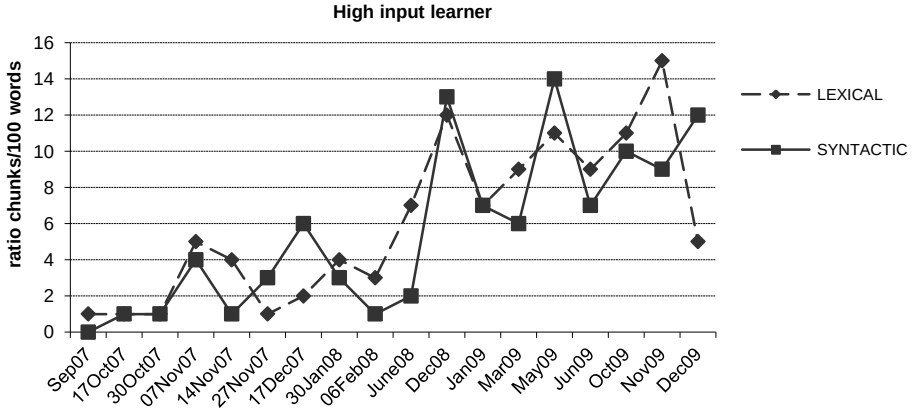


Figure 4-12: Interaction of fully fixed and partially schematic chunk in the high input learner over time.

4.5. Discussion

In this study we used writing samples of two types of learners, those in a low input condition and those in a high input condition to trace their language development, the use of chunks in particular. Seen from a usage-based perspective, in which frequency is considered one of the main factors in language acquisition, it is surprising that the high input learners do not use significantly more chunks than their low input counterparts.

The group study showed that lexical collocations, particles, and compounds are used before the other types of chunks (bi- and trinominals, textual adverbials, textual conjunctions, speech act formulae, phrasal verbs, idioms, variable idioms, and commonplaces). Because they consist of two words and are used in everyday language, we assume they are the most frequent ones. Because they consist of two words, they are indeed the shortest.

Overall, at the end of the study high input learners did use more chunk tokens than their low input counterparts, but this difference was not significant. There is only one significant difference in the type of chunk used: the high input group uses about four times as many conventionalized sentence stems, such as *one thing I know for sure is*+clause and *all they can do is*+clause, which are typically native speaker ways of expressing oneself. The interesting point is that these are the longer chunks that can only be picked up by frequent exposure to natural, authentic English. They are also the types of chunks that make the user sound more subtle and authentic than if he or she said *I know* or *they can* and this is exactly where the two groups differ. However, for all the hours of extra input, it seems a rather limited difference between the two groups and it does not seem to do justice to the actual differences in chunk use we observed when looking at the texts.

Therefore, to discover more about the process of learning, we traced the individual trajectories of two individual learners over time. They were at about the same level when they started, and each could be considered rather average for his or her group in that they were not the best nor the weakest students, but at the end there was a clear difference in the quality of their English, judging by the texts they wrote (see the introduction). The high input learner sounded more authentic and used a variety of chunks. However, a moving window of correlations showed that they developed quite similarly until the end, when the high input learner used more chunks.

It is not until we zoom in even more on the individual developmental trajectories that we discover differences. Both learners showed variability in their use of chunks, one day more, the next day less, but when we examined their variability patterns with a min-max graph, we saw that the low input learner had rather random variability without a discernible developmental pattern until the end of the study. In contrast, the high input learner showed rather clear phases, with a widening and narrowing of bandwidths of variability, which at the end especially narrowed and seemed to stabilize. This is exactly the type of variability one would expect to find in development: there are peaks (see the two arrows in Figure 4-13), suggesting overuse or U-shaped behavior, and moments of stabilization that are lower than the peaks, but higher than the previous steadier phases (see the ovals in Figure 4-13).

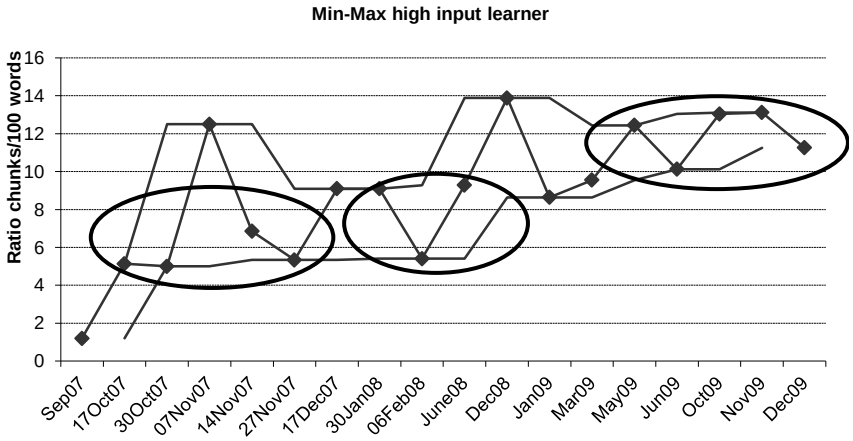


Figure 4-13: Min–max graph of a high input learner's chunk use with indications of development.

Next we looked not only at the number of chunks used, but also at the different types. A rough comparison between the two learners did not show any major differences between the two until the very end. However, when we took a closer look at the actual different types used, the differences between the two learners were quite apparent. For both the lexically and partially schematic chunks, the high input learner seemed to have a spurt in the use of different types after December 2008, a time when she also showed a peak in the total number of chunks used (see Figure 4-13). This was 18 months after the

beginning of her bilingual program and if we deduct 2 months for vacations, after approximately 960 hours of English exposure in school.

Finally, we looked to see if there were differences in the trajectories of fully fixed and partially schematic chunks over time. For the low input learner we saw a rather random pattern during the whole study (no correlation found). For the high input learner we saw that the two kinds seemed to develop in tandem (reflected in a fairly high correlation), but as was pointed out, a rather random pattern was also observed in the high input learner at the beginning until February 2008 (the first 300 hours of exposure). If we consider that our low input learner only had about 176 hours of exposure by November 2009, we may assume that these rather random patterns at the earliest stages of chunk use are to be expected. These findings suggest a number of points: first of all, chunk use has a slow start. As our low input learner showed throughout and our high input learner showed at the beginning stages, some chunks are used, but the number and types are quite limited. There is no discernible pattern of development to be seen. It is only after 18 months of instruction in the high input condition that the use of chunks all of a sudden seems to take off and settle quite soon after that.

The two studies, one group study with traditional statistics and one longitudinal study with DST methods and techniques, have each shown different aspects of development. The group study has shown the overall results: High input learners use significantly more conventionalized sentence stems than the low input learners. The longitudinal studies with DST methods and techniques have given us insight into the developmental process itself: learners start off using a limited number of chunk types sparingly and for the low input learner this remains the case throughout the study. The high input learner shows two "peaks" suggesting periods of slight overuse and then relatively stable periods in which more chunks were used. After December 2008, this learner shows a rather clear change in the diversity of types of chunks she uses.

4.6. Conclusions and implications

We hope to have shown that looking at writing samples of individuals over time in great detail, zooming in on individual constructions and using min-max graphs and moving windows of correlations to make the patterns visible, is useful in discovering developmental patterns. These analyses can show when

and how changes in the L2 learner's language system take place. Early on in chunk development, learners show random patterns of variability: they just try out whatever they can. There are also no discernible patterns for fully fixed or partially schematic patterns. However, after about 120 hours of exposure there was a jump and a rather stable phase and again after about 960 hours of exposure there was another jump followed by a rather stable phase in which a range of chunk types was used by the high input learner, suggesting that chunk development occurs in spurts.

Another conclusion we can draw is that chunk development, even in the best of circumstances, with highly motivated students in a high input condition, is slow. Our example learner did not show any clear signs of development in chunk use until after about 960 hours of instruction, all in a CLIL environment, which included native speaker teachers. However, this learner then showed a clear spurt, when she did not only use more chunks but also more different kinds of chunks. The low input learner, equally interested in languages, but with more traditional instruction, did not really show a clear pattern of development until the end of the study, most probably because of a lack of input and use. However, as the writing samples shown in the Introduction both learners developed their L2 in many other aspects: the words they used, the types of verb phrases, and types of sentence and clause constructions (cf. Verspoor, Schmid, & Xu, 2012). Further analyses will have to be conducted to see how the development of chunks interacts with these other linguistic aspects.

Finally, if we take a DUB approach seriously, we may assume that by writing the samples, our learners used the language in a meaningful way in their writing and actually changed their language by writing, trying out constructions they did not use before. Considering the difficulty we had in collecting the writing samples in our project, we conclude few teachers ask their students to write regularly and we feel that is unfortunate. It would be good if teachers appreciated more the wonderful opportunity writing gives to practice and use the language in a meaningful way, as fully discussed in several contributions in Manchón (2012)

Chapter 5
Conventionalized ways of saying things (CWOSTs) and L2 development[16]

5.1. Introduction

One of the challenges for L2 learners on their way to proficiency is learning how to combine words in authentic, natural sounding ways. This phenomenon is widely recognized in the literature as native-like selection (see for example Pawley & Syder, 1983; Wray, 2002) and perhaps best described by Langacker (2008b, p. 84) as "normal ways of saying things"; the preferred expressions of a certain notion out of all the ways permissible by the grammar and lexicon of the language. The following two texts show how L2 English learners express the same notion using three different formulations, all of which are perfectly understandable:

> (1) *When I am a grown up adult i would like to be a neurosurgeon. I would like to be a neurosurgeon when i am a grown up because i really like biology and i think i am quite good at it.*
>
> (2) *I seriously have no idea what kind of job I'd like to do. And I'm getting sick and tired of people who ask me that. Just because of that I'm in eighth grade, I'm probably supposed to know what I want to do when I grow up.*

[16] This chapter is a slightly edited version of Smiskova, H., Verspoor M., & W. Lowie (2012). Conventionalized ways of saying things (CWOSTs) and L2 development. *Dutch Journal of Applied Linguistics, 1*(1), 125-142.

When comparing these alternative formulations, some expressions are arguably more natural sounding than others; compare *when I grow up* and *when I am a grown up adult*. We argue that such natural-sounding expressions should be recognized as linguistic units in their own right (Langacker, 2008b, p. 84) so that they can be used to capture native-like selection in L2 development.

Because they cannot easily be defined in terms of traditional language subsystems such as grammar, vocabulary and phraseology, these expressions are often ignored in L2 research and instruction (Langacker, 2008b, p. 84). Usage-based approaches define language as an inventory of symbolic units with differing degrees of specification, with no strict separation between grammar, lexicon and phraseology. All linguistic units are seen as conventionalized pairings of form and meaning, regardless of their size and internal structure (Langacker, 2008a). Frequency of forms in the input is seen as one of the main factors driving acquisition (Ellis & Cadierno, 2009, p.117) and each learner is assumed to discover the regularities and patterns of an L2 through exposure and experience with the language.

Taking a usage-based (UB) perspective, the aim of this paper is to define *conventionalized ways of saying things (CWOSTs)* in L2 English so that they can be included in researching L2 development. First, we will define the phenomenon theoretically; then we will investigate to what extent it can be captured in written L2 data.

5.2. Theoretical background

Although there are many grammatically correct ways of expressing a notion beyond word level, there are only some that are preferred choices among proficient users of the language (native-like selection, Pawley & Syder, 1983). Native speakers are able to select the right combination of words out of the countless options allowed by traditionally described grammar and lexicon of the language, but L2 learners often make the mistake of combining words in grammatically correct but awkward-sounding ways. Native-like word combinations are generally referred to as *chunks* (also formulaic sequences, multi-word units, prefabs, lexical phrases, etc., Wray, 2002, p. 9), which are more or less fixed word sequences characteristic of fluent native-like language use.

The exact definition of a chunk differs across theoretical and methodological approaches depending on their research focus and purpose.

Granger & Paquot (2008) present a comprehensive overview of the field of phraseology (the study of multi-word units). They distinguish between two major approaches to multi-word units: traditional phraseological approach and frequency-based approach, both of which have a rather different scope. Traditional phraseological approach (Nesselhauf, 2004; Cowie, 1998) is mainly concerned with distinguishing between different types of multi-word units on the basis of linguistic criteria such as non-compositionality (idiomaticity) and fixedness (e.g. *blow the gaff*), and separating fixed multi-word units from free combinations (e.g. *blow a trumpet*). Frequency-based or corpus-driven approach (Sinclair, 1991; Biber, 2000) describes frequently occurring word combinations based on corpus-derived measures such as frequency and collocational strength, which may not fit linguistic categories (e.g., *the back of the,* Biber, 2000). Finally, psycholinguistic approaches and SLA approaches define chunks mainly as units processed and stored as a whole (Schmitt & Carter, 2004; Wray, 2002, 2008).

Even within these many valid perspectives, there is lack of agreement on which particular word sequences count as fixed chunks and which do not. This is partly because chunks are an overlap between traditionally defined language subsystems, such as morphology, lexicon, grammar, phraseology and discourse, and partly because their defining features (e.g. non-compositionality, fixedness, function) form a continuum, not discrete categories. Some word sequences are widely recognized as fixed chunks because they are prototypical examples of recognized categories; but there is some controversy about word sequences that lie at the end of the continuum of characteristic features. These units are fully predictable and regular in terms of syntax (Bybee, 2008, p. 231) and transparent in their meaning and may not be considered fixed; still, they are intuitively formulaic and native-like (Wray, 2002, p. 287) because they represent the preferred ways of saying things out of all the options in principle allowed by the grammar and the lexicon of the language.

Normal / preferred ways of saying things are crucial for learning an L2 (Langacker, 2008b, p. 84). This was confirmed in a longitudinal study by Smiskova & Verspoor (Chapter 3, in press), tracking the development of chunks in L2 English learners, which found significant differences over time between high and low-input learners in the category of preferred ways of saying things. Learners who made more use of these expressions sounded more fluent and native-like compared to learners who relied more on grammar, lexicon and traditional phraseology (compare *when I grow up* vs. *when I am a grown up adult*).

Clearly, this category of expressions captures an important difference in L2 development and deserves more attention. As a phenomenon, they have been described in the literature (Bybee, 2008, p. 231; Granger & Paquot, 2008, p. 35; Langacker, 2008b, p. 84; Pawley & Syder, 1983, p. 193; Wray, 2002, p. 287), but they need to be more clearly defined as linguistic units before they can be used in L2 research.

Taking a UB perspective, we conceptualize these units as the conventionalized pairings of form-meaning/function postulated by cognitive-constructionist approaches. We will use the term *conventionalized ways of saying things* (CWOSTs), where *conventionalized* is the extent to which the expression is established as the preferred formulation of a certain notion; *ways of saying* are the linguistic form (here, multi-word expressions) and the *things* are notions (concepts, themes) beyond word level. Since learners may express such notions by combining words in awkward ways, we also define *awkward ways of saying things* (AWSTs), where *awkward* means *in principle possible but not established as a preferred expression*. Finally, the phenomenon is defined in the context of L2 development, so CWOSTs are natural sounding, preferred, or native-like expressions of a notion, as opposed to awkward-sounding expressions of the same notion.

Conventionalization is closely related to frequency of occurrence. All linguistic units, including sentences such as *You know what I mean* have a token frequency (Bybee, 2008, p. 218) and conventionalized units are assumed to occur with high frequency. Therefore, one defining characteristic of a CWOST could be its high token frequency in reference corpora, preferably defined as a frequency band with a strict threshold (N. Schmitt, personal communication). Gries (2008) also argues strongly in favour of using Corpus Linguistic methods for SLA research from Cognitive Linguistics perspective. However, there is evidence that conventionalized expressions do not necessarily have high token frequency, as is the case in pure idioms (*kick the bucket*). Bybee (2008, p. 231) argues that even a simple two-word collocation such as *experience delays* is not highly frequent, even though it is established as the conventionalized way of expressing a certain notion. This suggests that the token frequency of an expression may be related to the frequency of the notion in question: if a notion occurs less frequently, the conventionalized expression (CWOST) will also occur less frequently. Finally, longer word sequences will automatically have lower token frequency than shorter word sequences. This suggests that a purely corpus-derived frequency criterion may not be sufficient to define CWOSTs in

general. However, token frequency should be enough to identify the conventionalized formulation out of a range of possible ones, because it will likely be the most frequent one. Possibly, the frequency distribution of all expressions within that range might be Zipfian (Ellis & Cadierno, 2009); i.e. the most frequent expression will be about twice as frequent as the next. This could potentially interfere with the identification of a CWOST, as the most frequent expression could simply be a prototype, i.e., the most generic in meaning and therefore most frequently used (Ellis & Cadierno, 2009, p. 121). This will probably depend on how we define the notions in question.

Corpus-derived frequency information is only a reflection of how linguistic forms are being used by language users: conventionalized expressions are shared in a speech community and the creators of conventionalization are language users themselves. Psycholinguistic research shows that fluent native speakers are highly sensitive to frequencies of linguistic forms (Ellis, Simpson-Vlach, & Maynard, 2008) and "store probabilistic relations between words" (pp. 376-377). Also, Wulff (2008) presents evidence that non-expert NS judgment of idiomaticity is highly consistent. These findings are consistent with usage-based approaches where frequency plays a crucial role and leads to conventionalization. We can therefore assume that proficient language users have valid intuitions about conventionalized forms and are able to recognize the conventionalized formulation out of the many possible expressions of a notion. Similarly, proficient users should intuitively be able to recognize awkward formulations because they are not established as the preferred forms. The added bonus of human intuition is that in language users this frequency sensitivity is context-rich and is linked to all the nuances of the meaning in all its facets. This richness of context may not be so easily evident from the corpora.

We therefore propose combining corpus-derived frequency information with native speaker judgment of naturalness as measures of conventionalization. Either frequency of occurrence or NS judgment of naturalness should be enough to identify the conventionalized way of expressing a notion among a range of possible ways. In order to operationalize CWOSTs as a general term, we will first investigate the relationship between the two measures (whether they correlate significantly) and then see if this relationship can be used to operationalize CWOSTs and AWSTs. If an expression is both frequent and consistently judged as natural, we can define it as a CWOST; similarly, if an expression is not frequent and judged as awkward, we can define it as an AWST.

5.3. The study

5.3.1. Research questions and hypotheses

We were interested to see if learners indeed use a range of ways to express a certain notion and wanted to find out if some of these are the established ways of expressing the notion (i.e., conventionalized). If so, out of that range they would be the most frequent and consistently judged as most natural by native speakers of English. If that indeed were the case, we would be interested in the relation between NS rating and frequency, namely, if they correlate. Finally, we wanted to see if combining the two measures of conventionalization could be used to operationalize a CWOST in general.

The research questions were formulated as follows:

RQ1: Do learners use a range of ways to express the same notion in accordance with grammar and lexicon?

RQ2: Among a range of possible ways of saying things, are some expressions consistently rated as natural sounding and others as less natural sounding or awkward?

RQ3: Among a range of possible ways of saying the same thing, are some expressions more frequent than others? Is there one that is most frequent? What is the frequency distribution in reference corpora?

RQ4: How is NS judgment of naturalness related to frequency of occurrence?

RQ5: Among a range of possible ways of saying things, can we identify the preferred formulation (the CWOST) using frequency of occurrence and/or NS rating of naturalness?

RQ6: Can the two measures of conventionalization be used to operationalize CWOSTs?

5.3.2. Participants

The first group of participants were 40 Dutch teenage learners of English aged 13 (both male and female, 23 in a high-input and 17 in a low-input instructional setting), who were asked to write short texts in L2 English on a given topic. The second group of participants were 39 native speakers of English (10 UK of which about a half are Irish, 10 US, 10 CAN, 4 AUS, the rest are "native speakers" of more than one language, e.g. English and Dutch), who were asked to judge the naturalness of expressions selected from the L2 learner texts (see Procedure).

5.3.3. Procedure

We let the notions emerge from our written L2 learner data by using a common writing task: by writing on the same topic the learners would likely attempt to express similar notions. Next, we used the definition to extract all the different ways of expressing the same notion from the learner writings. Then we recorded the token frequency of each expression in three different reference corpora and asked 38 native speakers of English to assess how natural (or awkward) each expression sounds. Finally, we were interested to see if the combination of the two measures can be used to operationalize a CWOST in L2.

Step 1: Collecting learner texts

40 L2 English learners in an instructional setting were asked to write a short text (maximum 200 words) answering the question *What do you want to be when you grow up?* The texts were collected in class: the learners were asked to type their texts into an electronic application, which limited them to writing maximum 200 words. No specific time limit was given; however, most learners did not spend more than 20 minutes writing the texts.

Step 2: Isolating themes in learner texts

Three most frequently occurring themes were isolated from the learner texts. In an answer to the question (*What do you want to be when you grow up?*) most learners first expressed some degree of knowledge (Theme 1), then referred in some way to their future job or profession (Theme 2), and finally, they referred to their later life as an adult (Theme 3).

These three themes were often linked in one sentence, such as *I don`t know what I want to be when I grow up*. From the learners' texts we extracted all the different ways the learners used to express these three general themes. Within these broader themes, we also identified smaller groups of expressions describing sub-themes such as "not knowing" versus "knowing".

Step 3: NS rating of naturalness

All expressions shown in Table 1 were compiled in a survey sent to 39 native speakers of English who were asked to indicate on a 4-point Likert scale (*4=very natural; 3=natural; 2=awkward; 1=very awkward*) how natural each of these expressions is when used in this particular context (i.e., when used by a teenager in response to the question *What do you want to be when you grow up?*). The 4-point scale was designed to distinguish between different degrees of natural and awkward. To narrow down the context as much as possible, all three themes were presented together and in the "natural" order, i.e. the way they most frequently occur in the learner texts (e.g. *I don`t know / what I want to be / when I grow up.*). Finally, we added two control expressions that are definitely not acceptable, since they violate grammar rules (marked red in the survey). These controls were not included in the subsequent analyses.

Step 4: Reference corpora frequency check

We recorded the token frequency of all these expressions in reference corpora, both standardized (BNC; Davies, 2004, and COCA; Davies, 2008) and web-based (WebCorp; Renouf, Kehoe, & Banerjee, 2007). Since most of the expressions do not occur in the standardized corpora, we used only the frequencies retrieved by WebCorp for further analysis. We opted for the retrieval of all concordances in all accessed webpages in order to capture the full frequency of occurrence. In some cases we had to narrow down the initial search using filter words and then manually check the retrieved concordances for context because some of the searched expressions can be used in a number of contexts not relevant to ours (e.g. *what I want to be*) or they can also occur as part of a different sequence (e.g. *what I want to be [doing]; what I want to do [with my life]*. The WebCorp Google API (Application Programming

Interface) we used to retrieve the concordances can only access a maximum of 64 webpages, which makes it possible to carefully control for the context of each searched expression.

5.3.4. Statistical analyses

First, we calculated the means and SDs of the NS rating for each expression. Next, we tested the correlation between both the means and the SD with each expression's token frequency as retrieved by WebCorp. We first tested correlations for the whole group of expressions; then for only those that actually occur in reference corpora (i.e., excluding learner expressions that have zero occurrence). To help us identify CWOSTs among a range of expressions of the same notion, we were also interested in the relation between NS ratings and corpus-based frequency within the individual (sub)themes.

Therefore, the correlational analyses were run for the following groups of expressions:

- all expressions grouped together (including those with zero token frequency)
- only expressions with a token frequency of at least 1
- expressions grouped by the three themes
- expressions grouped by the sub-themes

5.4. Findings

The findings are presented in the order of the research questions: (1) expressions used to express a certain notion extracted from learner texts, (2) native speaker judgment of naturalness, (3) token frequency of each expression as retrieved by WebCorp, including the visualization of token frequencies of expressions in each (sub)theme, and (4) the correlations between NS rating and token frequency.

5.4.1. Range of ways of expressing the same notions

Our findings show that L2 learners use a range of ways to express the same notion (RQ1). In the task-elicited learner texts, we identified 16 different

expressions to express the notion "Not knowing" and 4 expressions for "Knowing"; 10 expressions for "Acquiring a job" and 10 for "Becoming an adult". All these are in principle grammatically correct and also make use of correct lexical items and even phraseology (for instance *grow up; a grown up*).

Table 5-1: Expressions isolated from learner texts (grouped by themes and subthemes).

Theme 1: Knowledge (N=20)	
Subtheme A: Not knowing (N=16)	*I don't know*
	I don't really know
	I have no idea
	I don't know yet
	I don't have a clue
	I don't know exactly
	I seriously have no idea
	I'm probably supposed to know
	Well actually I don't know
	I mean how can I know
	I actually don't really know yet
	I really do not know
	I do not know
	I do not know exactly
	I don't have any idea about
	Further I don't really know
Subtheme B: Knowing (N=4)	*One thing I know for sure is that*
	The only thing I know for sure is that
	What I do know is that
	I do know
Theme 2: Future profession (N=11)	*what I want to be*
Subtheme C: Acquiring a job (N=10)	*what I want to do*
	what I wanna be
	what I wanna do
	what kind of job I would like to have
	what I want to become

	which job I want to have
	what to be
	which job I want to practice
	what my job would be
Subtheme D: Other (N=1)	*what I am supposed to do*
Theme 3: Adult life (N=13)	*when I grow up*
Subtheme E: Becoming an adult (N=10)	*when I am a grown up*
	when I am grown up
	if I grow up
	when I have grown up
	when I grown up
	when I am big
	when I am a grown up adult
	later, being even bigger than I am now
	later when I "grow up"
Subtheme F: Future life (N=3)	*later on in my life*
	later
	when I reach a certain age

5.4.2. Native speaker ratings of naturalness

Table 5-2: Native speaker ratings of naturalness (*4=very natural; 3=natural; 2=awkward; 1=very awkward*) rank-ordered by mean rating per theme and token frequency in WebCorp.

	mean NS rating	SD NS rating	Token frequency (WebCorp)
Theme 1: Knowledge (N=20)			
I don`t know	3.97	0.16	456
I don`t really know	3.92	0.27	167
I have no idea	3.92	0.27	195
I don't know yet	3.79	0.61	102
I don`t have a clue	3.59	0.72	83
I don`t know exactly	3.49	0.68	70
I seriously have no idea	3.41	0.79	160

I`m probably supposed to know	3.38	0.85	49
One thing I know for sure is that	3.36	0.93	61
The only thing I know for sure is that	3.26	0.99	74
Well actually I don`t know	3.1	0.91	44
I mean how can I know	3.1	1.1	47
I actually don`t really know yet	3.03	1.01	0
What I do know is that	2.79	1.13	59
I really do not know	2.69	0.89	68
I do know	2.59	1.02	79
I do not know	2.46	0.94	91
I do not know exactly	2.28	0.76	47
I don`t have any idea about	2.26	1.04	16
Further I don't really know	1.13	0.41	2
I know not (CONTROL)	1.03	0.16	196
Theme 2: Future profession (N=11)			
what I want to be	3.72	0.56	82
what I want to do	3.72	0.56	65
what I wanna be	3.64	0.74	320
what I wanna do	3.62	0.75	9
what kind of job I would like to have	2.97	1.11	8
what my job would be	2.44	1.1	0
what I want to become	2.44	0.91	33
what I am supposed to do	2.36	0.99	0
which job I want to have	2.31	1.03	8
what to be	2.03	1.14	66
which job I want to practice	1.21	0.47	0
what for job I want to do (CONTROL)	1	0	0
Theme 3: Adult life (N=13)			
when I grow up	3.9	0.38	532
later on in my life	3.13	0.89	32
later when I "grow up"	3	1.12	0
later	2.92	1.09	1
when I am a grown up	2.82	1	45
when I reach a certain age	2.59	1.02	42
when I am grown up	2.31	1	62
if I grow up	1.82	1.07	9
when I have grown up	1.74	0.85	48
when I grown up	1.54	1.1	49
when I am big	1.54	0.79	28
when I am a grown up adult	1.41	0.82	0
later, being even bigger than I am now	1.1	0.31	0

5.4.3. Token frequency distribution in WebCorp

Figures 5-1 to 5-3 in this section show the distribution of token frequencies of the expressions retrieved by WebCorp (Renouf, Kehoe, & Banerjee, 2007) using the Google API and counting all occurrences on each accessed webpage (maximum 64 webpages per search). As indicated in the figures, some searches had to be narrowed down using word filters and checked manually for relevant context.

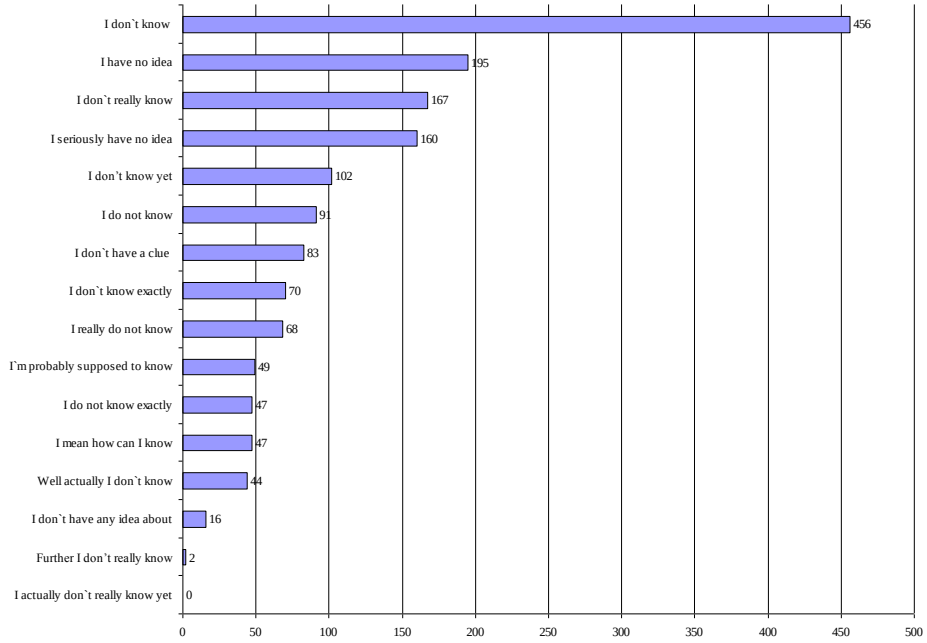


Figure 5-1: Token frequency retrieved in WebCorp via API Google for expressions grouped under Sub-theme A (Not knowing).

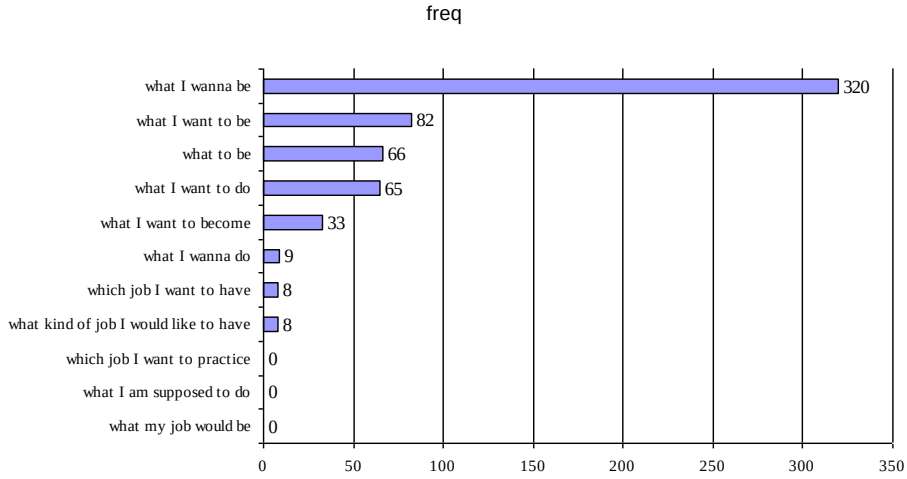


Figure 5-2: Token frequency (checked for context) retrieved in WebCorp via API Google for expressions grouped under Theme 2.

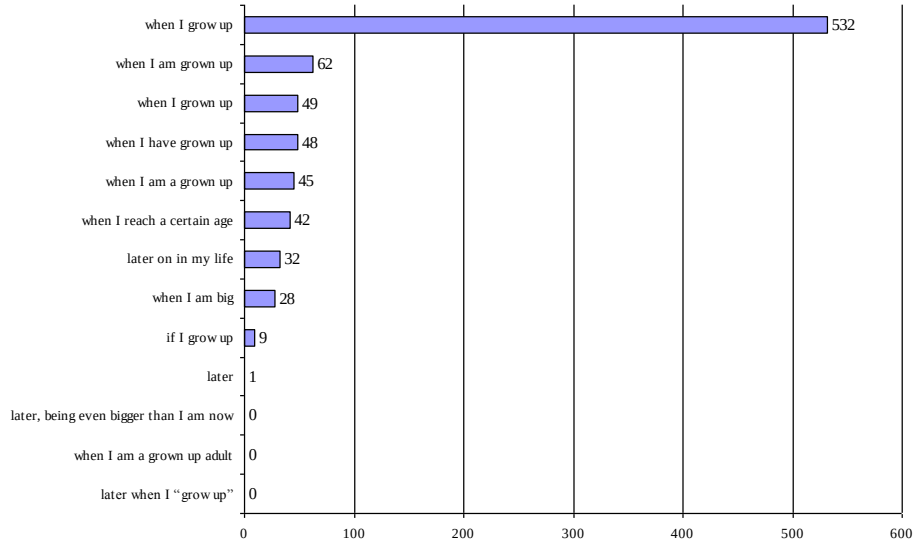


Figure 5-3: Token frequency (checked for context) retrieved in WebCorp via API Google for expressions grouped under Theme 3.

In the range of possible expressions investigated here there is always one with the highest token frequency followed by expressions that are used much less

and some L2 learner expressions that have zero frequency of occurrence. Figures 5-1 to 5-3 show that within the themes and sub-themes, the frequency distributions appear to be Zipfian (i.e. the most frequent expression is roughly twice as frequent as the second most frequent, etc.).

5.4.4. Correlation NS rating and token frequency

Table 5-3 shows the correlations between native speaker ratings of naturalness and token frequencies in WebCorp.

Table 5-3. Correlations (two-tailed; * significant at the 0.05 level; ** significant at the 0.01 level)

	Spearman's rho Freq/mean rating	Spearman's rho Freq/SD rating	Spearman's rho mean rating/SD rating
all items (N=44)	.643**	-.389**	-.374*
min freq 1 items (N=37)	.626**	-.513**	-.611**
Theme 1: Knowledge (N=20)	.712**	-.531*	-.595**
Theme 2: Future profession (N=11)	.577	-.194	-.366
Theme 3: Adult life (N=13)	.290	-.053	.289
Subtheme A: Not knowing (N=16)	.808**	-.644**	-.629**
Subtheme B: Knowing (N=4)	-.400	-.200	-.800
Subtheme C: Acquiring a job (N=10)	.580	-.147	-.355
Subtheme E: Becoming an adult (N=10)	.455	-.012	.354
Subtheme F: Future life (N=3)	-.500	-.500	-.500

For all the extracted expressions, there is a strong significant correlation between NS rating and frequency (the rating is higher/more natural with increasing frequency); there is a moderate negative significant correlation between the raters' agreement and frequency (the SD of the rating goes down with increasing frequency). Finally, there is a moderate negative significant correlation between the mean rating and the agreement (the SD of the rating goes down with higher rating; i.e., the more natural the expression is rated, the more they agree).

For expressions that have a minimum frequency of 1 in the reference corpus, there is again a strong significant correlation between NS rating and frequency, a moderate negative significant correlation between the raters' agreement and frequency, and a strong negative significant correlation between the mean rating and the agreement.

For the individual themes this varies: whereas for expressions in Theme 1 (Knowledge), the correlations are strong and significant, for Theme 2 (Future profession) they are moderate to weak and not significant, and for Theme 3 (Adult life) they are also weak and not significant.

For the subthemes it also varies: for Subtheme A (Not knowing) all correlations are strong and significant, while for the other subthemes they are not significant and range from weak to strong.

5.5. Discussion

The findings of this study have confirmed our expectation that L2 learners use a range of formulations to express the same notion (RQ1). All their expressions are in principle grammatically correct and also make use of correct lexical items and even phraseology (for instance *grow up; a grown up*). However, some of these expressions were rated by native speakers of English as very natural or natural, while others as less natural or even awkward (RQ2). For instance, among the range of expressions expressing the notion "becoming an adult", the expression *when I grow up* was rated as most natural while showing high rater agreement (mean rating 3.9, SD 0.38). In contrast, the expression *when I am a grown up adult* expressing the same notion was rated as very awkward with fairly high rater agreement (mean rating 1.41, SD 0.82). A similar tendency can be observed in all three of the general themes investigated in this study: out of the range of expressions that the learners used, there is one or a few rated as (very) natural with a high rater agreement. Other expressions within that range

were rated as less natural or awkward. There are also strong frequency effects (RQ3): among a range of possible formulations of the same notion some expressions are more frequent than others and some learner expressions do not occur at all. The frequency distributions within the (sub)themes appear to be Zipfian, i.e., with the most frequent expression being roughly twice as frequent as the second most frequent.

Next, there is a rather strong correlation between NS rating of naturalness and frequency of occurence (RQ4), showing that expressions are rated as more natural-sounding when they are more frequent, and that the more frequent the expression, the more the NSs agree on their rating. Finally, there is more rater agreement on expressions that are rated as natural and less rater agreement on expressions rated as awkward. These findings confirm that NSs are highly sensitive to frequency and that frequency is closely related to conventionalization (frequency is the result as well as the driver of conventionalization). For the actual identification of CWOSTs the correlations are less useful. Firstly, the number of expressions within the individual (sub)themes in rather low (N<10) for the correlations to achieve significance. Secondly, the correlations may only reflect pure frequency effects, such as in Subtheme A ("Not knowing"), where all correlations are strong and significant but the range of expressions refers to different meaning dimensions (as discussed further down in this section).

Our next question was if among a range of possible ways of expressing a notion we can identify the preferred formulation (the CWOST) using frequency of occurrence and/or NS rating of naturalness (RQ5). Using these two measures, the CWOST can be reliably identified in Theme 3 (Adult life). There are two sub-themes of which Sub-theme E (Becoming an adult) has a very clearly defined meaning and represents a scale of possible expressions of the same notion. This scale clearly distinguishes between "normal ways of saying things" and "awkward ways of saying things" on all our measures. One expression (*when I grow up*) stands out in terms of the highest token frequency, highest mean rating, and high rater agreement (freq 532, mean rating 3.9, SD 0.38). The frequency distribution of all expressions within the subtheme appears to be Zipfian, with the one being by far the most frequent; a similar "jump" is also reflected in the NS rating of naturalness. We can conclude that the expression *when I grow up* represents the conventionalized way of expressing the notion

"becoming an adult" - as opposed to other expressions of the same notion that are possible in terms of grammar and lexicon but are not preferred.

The situation is more complex in the other themes and sub-themes. In Sub-theme C (Acquiring a job), the expression *what I wanna be* has by far the highest token frequency but not the highest mean rating and not the highest rater agreement (freq 320, mean rating 3.64, SD 0.74), which does not allow us to single out one clear CWOST. In sub-theme A (Not knowing), the most frequent expression is *I don`t know*, with the highest mean rating and highest rater agreement (freq 456, mean rating 3.97, SD 0.16), so it could be considered a CWOST. However, it is debatable whether *I don`t know* really can be interpreted as a CWOST - that is, the preferred way of expressing the notion "not knowing" among all the other expressions. Sub-theme A also contains expressions with intensifiers and softeners that are a scale of nuanced meaning dimensions (for example, compare *I don`t know* and *Actually, I don`t really know yet*), all quite frequent and judged as natural-sounding, i.e., conventionalized expressions for subtly different meanings. The expression *I don`t know* should probably be regarded as a prototype construction within its sub-theme, i.e. an expression that is most frequent and generic in meaning (Ellis & Cadierno, 2009, p. 121).

Unlike theme 3, themes 1 and 2 do not allow us to single out one clear CWOST among their range of expressions. One reason for this discrepancy could be the role of token frequency as an indicator of conventionalization. While expressions do not necessarily have to be highly frequent to be established as conventionalized (Bybee, 2008, p. 231), we have already shown that a conventionalized expression is certainly more frequent than a less conventionalized expression of the same notion; compare *when I grow up* (freq. 532) vs. *when I am a grown up* (freq. 45), *what I want to be* (freq. 82) vs. *which job I want to practice* (freq. 0). However, our findings show that this is quite complex. For example, *I know not* was used as a control in our survey since it violates grammar rules; and indeed, the NSs rated it as very awkward (mean 1.03) with a high rater agreement (SD 0.16). At the same time, *I know not* has a high token frequency in all three consulted reference corpora (BNC, COCA, WebCorp, all manually checked for context) and was the second most frequent expression in its theme. This is not surprising since corpora observations show that *I know not* is an expression frequently employed and conventionalized in performing arts and literature. Finally, the assumption that expressions with zero token frequency cannot be conventionalized also does not hold, since this may depend on the reference corpus: the expression *I seriously have no idea* is the

fourth most frequent in WebCorp (and has been rated as natural with high rater agreement) but has zero token frequency both in BNC and COCA. Clearly, corpus-derived token frequency as a measure of conventionalization should be interpreted in the context of the data and retrieved from suitable reference corpora.

These findings lead us to conclude that there may not be an exact mapping between token frequency, mean NS rating and rater agreement that would produce exact quantitative criteria for an operationalization of CWOSTs (RQ6). Out of all the (sub)themes in our study, we were able to identify the CWOST in one case only: Subtheme E ("Becoming an adult"), where all three measures conspire to clearly indicate the preferred formulation (*when I grow up*) for that particular notion. Within its range it is the one most frequent expression, rated by native speakers as most natural sounding with high rater agreement. The token frequency distribution of all the possible expressions within the range is Zipfian, with the CWOST as the most frequent expression.

Other themes and sub-themes investigated in this study do not lend themselves to such clear-cut operationalization. Firstly, prototypical verb constructions (*I don't know*) can be the more frequent and judged natural, leaving another rather conventionalized sounding expression such as *I seriously have no idea* in its shadow. Also, broader (sub)themes (such as "Not knowing") may include expressions with different meaning dimensions that are not easily comparable and may all be similarly conventionalized. Finally, corpus-derived frequency counts may depend on the corpus in question and show quite the opposite of what native speakers find natural (as shown in the case of *I know not*). We suggest that in order to operationalize "conventionalized ways of saying things", a more precise measure of conventionalization is needed; also, the notions have to be defined very narrowly to enable better comparison of different formulations.

5.6. Conclusion

We see the main value of this paper in showing that *conventionalized ways of saying things* (CWOSTs) should be recognized as linguistic units and researched in L2 development. Taking a usage-based perspective, we define CWOSTs as multi-word form-meaning/function mappings, regardless of their size and internal structure. This means that their status as a unit should not be based on their linguistic form but on the fact that they express one beyond-word-level

notion. This matters in L2 development, because it is beyond-word-level notions that learners often express awkwardly. By using texts on a common topic written by L2 learners with different levels of proficiency, we were able to gather a range of formulations that L2 learners used to express the same notion (such as "becoming an adult"). Using two measures of conventionalization - token frequency and native speaker judgment of naturalness - we have shown that some of these learner expressions are the conventionalized formulations of a notion (judged as natural by NS and occurring frequently, such as *when I grow up*), while other formulations are possible but not conventionalized (judged as awkward by NS and having low or zero occurrence, such as *when I am a grown up adult*). However, the two measures have failed to produce exact quantitative criteria for the operationalization of a CWOST. This may be caused by difficulties with corpus-derived frequency counts; also, beyond-word-level notions are difficult to capture reliably due to nuances in meaning and prototype effects. To conclude, we argue that in L2 development attention should be paid to *how learners say things* – how they express notions beyond word level, because they may do so in rather creative ways in accordance with grammar, lexicon and phraseology that do not sound natural.

Chapter 6

Making do: Constructing form-meaning mappings in L2[17]

6.1. Introduction

Multi-word expressions (chunks) are a characteristic feature of authentic, native-like use of language. From a usage-based perspective they can be seen as conventionalized form-meaning mappings, i.e., the conventionalized ways of expressing beyond-word-level concepts. Chunks are crucial for target-like L2 development and authentic language use (Pawley & Syder, 1983; Wray, 2002), and can also be used as a measure of L2 proficiency (Verspoor, Schmid, & Xu, 2012). However, for L2 learners, chunks are notoriously difficult to master (Wray, 2002; Ellis, 2001). Moreover, the most pervasive chunk type in authentic language use is perhaps the one most difficult to acquire: the preferred ways of saying things out of all the possible options in line with traditionally described grammar and lexicon (Langacker, 2008b, p. 84; Bybee, 2008, p. 231). These are the "conventionalized ways of saying things", CWOSTs (Smiskova, Verspoor, & Lowie, 2012) for particular beyond-word-level concepts: compare *when I grow up* and *when I am a grown up adult*. For L2 learners, such multi-word expressions are difficult to recognize as conventionalized form-meaning mappings, because they are not salient as fixed word combinations.

From a usage-based perspective, one of the main problems with acquiring CWOSTs could be the fact that L2 learners already have established L1 conventionalized form-meaning mappings. These are in direct competition with L2 form-meaning mappings (Ellis & Cadierno, 2009). While L1 users

[17] This chapter is a slightly edited version of Smiskova-Gustafsson, H. (Under Review). Making do: Constructing form-meaning mappings in L2. Submitted to *Cognitive Linguistics*.

would treat a CWOST as a whole semantic unit and map the conventionalized form onto the beyond-word-level concept, L2 learners may first draw on their L1 constructions and establish a slightly different form-meaning mapping for the same beyond-word-level concept. As a result, they may have to invent a linguistic "make-do solution" (Larsen-Freeman, 2012, p. 104) in order to express the beyond-word-level concept because they do not have the conventionalized form (the CWOST) available.

This paper investigates whether two selected CWOSTs are established / constructed as whole form-meaning mappings in L2, as evidenced in L2 learners' written production. The aim is to contribute to the understanding of L2 acquisition and use of multi-word expressions from a usage-based, cognitive-constructionist perspective.

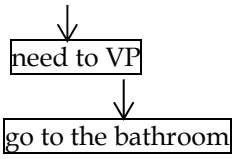
6.2. Theoretical background

The present study takes a usage-based, cognitive-constructionist approach to language and language learning. Language is seen as a structured inventory of constructions, which are conventionalized pairings of meaning and form of differing degrees of schematicity. Constructions range from lexically specific units such as words and idioms, to productive abstract schemas such as the verb-argument construction. Every utterance consists of nested constructions (Ellis & Ferreira-Junior, 2009b, p. 188), which in turn map onto nested concepts. Language learning is the learning of constructions during usage events by mapping conventionalized linguistic form onto meaning (Ellis & Cadierno, 2009). In L1, the acquisition of new forms goes hand in hand with the acquisition of new concepts (i.e., language is constructed together with new meanings), with frequency of forms in input playing a crucial role in the process. Fully productive abstract constructions - such as the verb-argument construction - develop by generalizing over lexically specific chunks. So from a usage-based perspective, L1 path of acquisition proceeds from a lexically specific chunk via a low-level schema to a productive abstract construction (Tomasello, 2003). High token frequency leads to the entrenchment of lexically specific units, whereas high type frequency leads to the establishment of abstract schematic constructions (Ellis & Cadierno, 2009).

Usage-based accounts of L1 production reflect the nature of usage-based L1 acquisition: when producing utterances, language users select the degree of specification that is needed, and cut & paste previously encountered lexically

specific units (words or phrases) into slots in more or less abstract constructions (Dabrowska & Lieven, 2005; Langacker, 2008b). Dabrowska & Lieven (2005) traced the development of children's productivity in terms of two types of units: fixed phrases (e.g., *to the shop)* and low-level schemas (frames with slots, e.g. *Shall we VP then? You don't VP, do you?*). They show that about 90% of the children's utterances can be accounted for by the simple cutting and pasting of previously encountered chunks into slots in low-level schemas (frames with slots). They also show that the cutting and pasting takes place at different levels of the utterance, as in the example below (Dabrowska, 2012):

You don't VP, do you?



Previous research has shown that many of the same usage-based processes also apply in L2 acquisition (Ellis & Cadierno, 2009), in that the learning of an L2 is also the frequency-biased learning of constructions from usage. For example, Ellis & Ferreira-Junior (2009a) demonstrated that when learning abstract verb-argument constructions (the VOL construction, V Obj $Obl_{path/loc}$, and the VOO construction, V Obj Obj2) naturalistic adult L2 learners acquire the most frequent and prototypical exemplar, with pathbreaking verbs in the constructional islands (*put* in the VOL and *give* in the VOO). Ellis & Ferreira-Junior (2009b) show how a productive verb-argument construction is gradually abstracted from frequently encountered exemplars, starting with the prototypical, pathbreaking exemplar (e.g., *put it on the table -> put it L -> V it L -> VOL*). Eskildsen's (2008) longitudinal study followed a Spanish learner of English who developed "utterance schemas" (similar to low-level schemas) such as *Can you V?* on the basis of previously encountered lexically specific chunks (such as *Can you write?*).

However, constructing an L2 is different from constructing an L1 (Ellis & Cadierno, 2009). While in some cases, (some) constructions may indeed be acquired this way (Eskildsen, 2008; Eskildsen & Cadierno, 2007) this exact path may not apply in all cases and for all constructions. As opposed to young children learning L1 constructions alongside L1 concepts, L2 learners already have their L1 constructions and L1 concepts in place, together with "myriad

categories and schema" (Tyler, 2012, p. 89) and tend to construct their L2 on top of their L1. At the same time, frequency of L2 forms in input plays a major role – but the amount and character of input may differ considerably for each L2 learner, which in turn means that different learners will have different L2 resources available. It can be expected that L1 influence and the availability of L2 resources will in some way interfere with the proposed usage-based path of acquisition.

L1 plays an important and varied role in how learners construct form-meaning mappings in L2. From a usage-based perspective, L1 influence is often manifested in L2 production as meaning transfer (involving various kinds of semantic and pragmatic influence from the L1), conceptual transfer (involving transfer of L1 construal), and different "thinking-for-speaking" ("a special form of thought that is mobilized for communication" Slobin 1996, p. 76; Odlin, 2008). Research on L1 influence has been done specifically on cross-linguistic influence in conceptual semantic domains of space, time, and motion, mainly in typologically very different languages (Cadierno, 2008). However, the role of L1 may be more or less prominent depending on the learners' general proficiency. Learners in lower and intermediate stages of L2 acquisition tend to construct form-meaning mappings in the L2 based on their entrenched L1 constructions (Cadierno, 2008).

These factors will likely be reflected in L2 production. While the usage-based cut & paste process in L2 may be similar to that in L1, what is pasted (i.e., specific lexical material) and where (i.e., more or less schematic constructions at different levels) may be heavily influenced by the available L2 resources and by entrenched L1 constructions. Unlike L1 users, L2 learners may not always just cut and paste based on what they have heard, rather, they may do so based on the interplay of their L1 constructions and the frequency of L2 forms. So L2 production may also mean filling an abstract L1 construction with whatever lexically specific material the learners have available to them in terms of single words and phrases. This may especially be true in cases where L1 and L2 constructions are quite similar – such as verb-argument constructions (VOL and VOO) in L1 Dutch and L2 English. And since every utterance consists of multiple constructions that are nested, learners may cut & paste this way at different levels of the utterance.

One example of form-meaning mappings that may be heavily influenced by these factors are conventionalized ways of saying things (CWOSTs): the

preferred multi-word expressions for a certain beyond-word-level concept. They may be difficult to establish in the L2 both due to influence of L1 constructions (form-meaning mappings) and the general frequency and salience of the CWOST. As a result, L2 learners may not have CWOSTs available for use. When attempting to express the beyond-word level concept, they may have to be creative and invent linguistic "make-do solutions to make meaning under the pressures of communication in real time" (Larsen-Freeman, 2012, p. 104). Such learner expressions may be in line with L2 grammar and lexicon but still sound rather awkward, because they do not describe the particular concept using a conventionalized L2 expression (compare the conventionalized expression *when I grow up,* and a learner expression *when I am a grown up adult;* Chapter 5). In this study, the term "make-do solutions" is used for similarly "awkward" learner expressions referring to a beyond-word-level notion for which there is a CWOST in the L2.

L2 learners' make-do solutions for a certain beyond-word-level concept can be a source of valuable information about how specific form-meaning mappings are constructed in the L2. Firstly, since make-do solutions serve to express a notion for which there is a conventionalized expression (CWOST) in the L2, they can show the extent to which the L2 CWOST is available to the learners. Next, learners with the same L1 will likely build similar make-do solutions, because they may be similarly affected by their L1 form-meaning mappings. Learners at lower levels of L2 proficiency can be expected to heavily draw on their L1, because they have likely had less exposure to the CWOSTs than learners at higher levels of L2 proficiency. These commonalities may give rise to emerging patterns of use across a learner population; moreover, the patterns may occur at different levels of the expressions since every utterance consists of nested constructions. Such emergent patterns of use are a trace of productive processes, so they may give an indication of cut & paste processes in L2 and how these processes relate to the constructed form-meaning mappings.

To sum up, the emergent patterns of use across L2 learners' expressions for the same beyond-word-level concept may give an indication of how form-meaning mappings are constructed in the L2.

6.3. The study

The aim of the present study is investigate whether two selected CWOSTs are constructed as whole form-meaning mappings, i.e., as the conventionalized multi-word expressions for specific beyond-word-level concepts. The study uses task-elicited written L2 texts on the same topic (which allows the comparison of L2 learner expressions for the same beyond-word-level concepts) from a larger group of L2 learners at different levels of L2 proficiency. The learner expressions are then analyzed for emergent patterns.

6.3.1. Research questions

Taking a usage-based perspective, the present study aims to address the following two questions:

a. Are conventionalized ways of saying things (CWOSTs) for selected beyond word-level concepts constructed as whole form-meaning mappings in L2?
b. If that is not the case, what form-meaning mappings are constructed instead?

In order to address the questions, the study explores the following hypotheses:

H1. Most learner expressions referring to the selected beyond-word-level concepts will not be the L2 CWOSTs.

H2. There will be emergent patterns of use across the learner expressions, possibly at different levels of the expressions, showing some effects of L1 Dutch and/or of general frequency of L2 English forms.

H3. Learner expressions at higher L2 proficiency levels will be CWOSTs or their close approximations; learner expressions at lower proficiency levels will be make-do solutions, showing effects of L1 Dutch.

6.3.2. Participants

In order to elicit learner expressions at a range of L2 proficiency levels, we selected a group of Dutch learners of English (N=167) enrolled at six different Dutch secondary schools. Approximately half of the group were attending a Dutch semi-immersion language education program (TTO) and the other half were attending a Dutch regular language education program. The non-immersion students had 2 hours of English a week with a non-native speaker of English; the semi-immersion students had about half their subjects taught in English (e.g. geography and history), plus 5 hours a week of English as a subject taught by a native speaker with a total of 15 hours of exposure per week. The students were aged around 13, both male and female, and all had a similarly high scholastic aptitude as determined by the Dutch CITO test (taken by most children around age 11 or 12).

6.3.3. Procedure

Collecting learner texts

To obtain learner expressions of similar concepts, the learners were given a common writing task. They were asked to complete the task in class using an electronic application (ISEK[18]), which limited them to about 200 words. There was no time limit but most learners were finished within about 15 minutes. The task was phrased as follows: *Pretend you have just won 1000 euro. Write a short text (approx. 150 words) about what you would do with the money*.

Rating L2 proficiency

The learner texts were holistically assessed for general L2 proficiency; the procedure was carefully controlled to ensure high inter-rater reliability (for a detailed description of the procedure see Verspoor, Schmid, & Xu, 2012). A group of eight experienced ESL teachers (three native speakers of English, two of Dutch and one each of Chinese, Portuguese and Spanish) rated the texts according to six levels of L2 proficiency (level 1 - level 6), where level 1 is a beginner level and level 6 is an intermediate level.

[18] ISEK is a web application for educational purposes developed at the University of Groningen, The Netherlands.

Extracting and analyzing learner expressions

The learner texts were manually checked for frequently expressed beyond-word-level concepts - as the learners were writing on the same topic (see task specification above), most of them were trying to express similar ideas. The most frequently expressed beyond-word-level concepts across the learner population were two actions: DEPOSITING MONEY, and DONATING MONEY. All learner expressions referring to the concepts were extracted manually (see example below).

> *Everybody wants to win money, some so you could buy a new car, some for going on holiday. But what I want is rather boring. I think I would put the half of my money on a bank. The other half I would spend on charity I think,100 euro's for Unicef and maby 100 euro's for testanimails. I think that you just can't kill animails for make-up. But I would also go shopping in Amstedam.*
>
> Concept 1: DEPOSITING MONEY
> Concept 2: DONATING MONEY

The extracted expressions were first analyzed for common patterns at different levels (word- to phrase-level) and degrees of schematicity.

Establishing CWOSTs in English

The WebCorp Linguist's Search Engine (WebCorp LSE; Renouf, Kehoe, & Banerjee, 2007) was consulted to establish which expressions are most frequently used in English to refer to the selected concepts. Both type frequency and token frequency of the expressions were recorded.

The findings retrieved via WebCorp LSE show that the CWOSTs for the two concepts are conventionalized phrases and slot-frames with a verb-argument structure.

The CWOST for DEPOSITING MONEY is the slot-frame *put NP in the bank*, which occurs 23 times in total, with 16 different variants in the NP slot (i.e., the token frequency of the CWOST is 23, the type frequency is 16). The most frequent instantiations are two fixed phrases: *put it in the bank* and *put money in the bank*. The phrases and slot-frames are instantiations of the Verb Object Locative construction (VOL: V Obj $Obl_{path/loc}$)

The CWOST for DONATING MONEY is the slot-frame *give * to charity*, which occurs 80 times in total, with 39 slot variants[19]. The most frequent instantiations are *give the money to charity* and *give it to charity*. The phrases and slot-frames are instantiations of the ditransitive VOO construction (V Obj Obj2).

So the English CWOSTs for the two selected concepts were established as follows:

DEPOSITING MONEY: *put NP in the bank*
V Obj $Obl_{path/loc}$

DONATING MONEY: *give * to charity*
V Obj Obj2

Establishing CWOSTs in Dutch

Dutch equivalents of the learner expressions were established as L1 reference. A group of five Dutch high-school teachers of English were asked to read the learner texts and give the Dutch equivalent for each learner expression. The given equivalents were both fixed phrases in the infinitive form and expressions in the first person singular (closely following the learners' L2 English expressions, which were also in the first person). Both forms were used as L1 reference (see Table 6-1), since in some cases Dutch requires a different word order than English.

[19] The slot variants can be NPs such as *give money to charity,* but also AdvP, such as *give generously to charity*.

Table 6-1: Dutch CWOSTs for the two selected concepts.

DEPOSITING MONEY	
fixed phrase	1st person singular
op de bank zetten	*zet NP op de bank*
on the bank put$_{INF}$	put NP on the bank
op de bank doen	*doe NP op de bank*
on the bank do$_{INF}$	do NP on the bank
op de bank sparen	*spaar NP op de bank*
on the bank save$_{INF}$	save NP on the bank
op de bank storten	*stort NP op de bank*
on the bank deposit$_{INF}$	deposit NP on the bank
DONATING MONEY	
fixed phrase	1st person singular
geld aan een goed doel geven	*geef NP aan een goed doel*
money on a good purpose give$_{INF}$	give$_{1st\ SING}$ NP on a good cause / purpose
geld aan goede doelen geven	*geef NP aan goede doelen*
money on good purposes give$_{INF}$	give$_{1st\ SING}$ NP on good causes / purposes

6.4. Findings

This section presents findings related to the three hypotheses. The main research questions will be addressed in the Discussion section.

H1. Most learner expressions referring to the selected beyond-word-level concepts will not be the L2 CWOSTs.

Tables 3 and 4 in Appendices show the full list of the learner expressions ranked by proficiency levels for DEPOSITING MONEY (N=48) and DONATING MONEY (N=96), respectively. Out of the 48 learner expressions referring to DEPOSITING MONEY, there are two learner expressions matching the conventionalized slot-frame *put NP in the bank*; i.e., the L2 CWOSTs constitute 15.6% of all learner expressions for the first concept. Out of the 96 learner expressions referring to DONATING MONEY, there are 15 learner expressions matching either the slot-frame *give * to charity,* 3 expressions exactly matching the frequent fixed phrase *give it to charity* and 1 expression exactly matching the frequent fixed phrase *give the money to charity*. Altogether, the L2 CWOSTs constitute 4.2% of all learner expressions for the second concept.

H2. There will be emergent patterns of use across the learner expressions, possibly at different levels of the expressions, showing some effects of L1 Dutch and/or of general frequency of L2 English forms.

There are emergent patterns at different levels of the expressions (from word- to phrase level) and of different degrees of schematicity (i.e., from lexically specific units to slot-frames and low-level schemas). This means that most of the emergent patterns are nested: for example, an emergent pattern in the use of verbs such as *put* may also be part of a verb+prep pattern, such as *put on*, which in turn may be part of a longer slot-frame (*put NP on the bank*). Moreover, since we are dealing with learners' make-do solutions, any one of these units may also be used in combination with various other units (i.e., not as part of an emergent pattern). For example, the verb *put* also occurs in other combinations, such as *put into;* and *put on* may be followed by other objects such as *bank account.* Finally, there is a degree of individual variation, which may pertain to one or more aspects described above.

Therefore, the emergent patterns will be presented from the lowest and most specific level (e.g., verbs) to the highest and most schematic (e.g., abstract verb-argument constructions). Tables 6-2 and 6-3 give an overview of all emergent patterns.

Emergent verbs

Firstly, there are emergent patterns in the use of verbs: about half of all learner expressions for DEPOSITING MONEY contain the verb *put* (46%); and the majority of learner expressions for DONATING MONEY contain the verb *give* (85%). The preference for *put* and *give* shows effects of L2 English frequency, since the two verbs are characteristic of the verb-argument constructions related to the two concepts (VOL and VOO, respectively). About half of the expressions for DEPOSITING MONEY contain a range of verbs that show influence of L1 Dutch (*set, do, store, save* - *zetten / doen / storten / sparen*). Figures 6-1 and 6-2 show the frequency distribution of all verbs used in the two concepts.

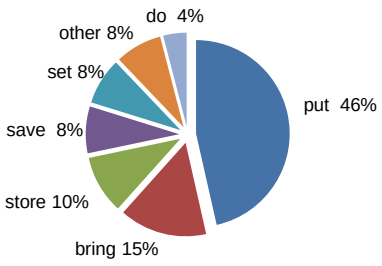


Figure 6-1: Verbs in DEPOSITING MONEY.

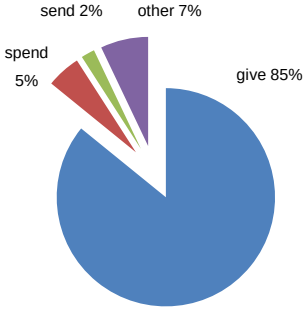


Figure 6-2: Verbs in DONATING MONEY.

Table 6-2: Emergent patterns in learner expressions for DEPOSITING MONEY (N=48).

verbs	N	%	V prep	N	%	Obj	N	%	slot-frames	N	%	schema	N	%	VAC	N	%
put	22	45.83	put on	15	31.25	DET bank	36	75	put NP on DET bank	12	25	V on NP	27	56.25	VOL	39	81
bring	7	14.58	bring to	7	14.58	DET bank account	4	8.33	bring NP to the bank	5	10.42						
save	4	8.33	save on	5	10.42	other	4	8.33	save NP on DET bank	5	10.42						
set	4	8.33	put in	5	10.42				set NP on DET bank	3	6.25						
store	5	10.42	set on	3	6.25				do NP on DET bank	2	4.17						
do	2	4.17	do on	2	4.17				put NP in the bank	2	4.17						
other	4	8.33	other	6	12.5				put NP in DET bank account	2	4.17						

Table 6-3: Emergent patterns in learner expressions for DONATING MONEY (N=96).

verbs	N	%	V prep	N	%	Obj	N	%	slot-frames	N	%	VAC	N	%
give	82	85.42	give to	74	77.08	(various NPs)	44	45.83	give NP to NP	36	37.5	VOO	84	87.5
spend	5	5.21	give away to	5	5.21	charity	19	19.79	give NP to charity	15	15.63			
send	2	2.08	spend on	4	4.17	charities	13	13.54	give NP to charities	11	11.46			
other	7	7.29	give on	2	2.08	a charity	7	7.29	V NP PREP charity (organisations)	10	10.42			
			other	7	7.29	(a) charity organisation(s)	4	4.17	give NP to a charity	6	6.25			
						good organisation(s)	2	2.08	give NP away to NP	5	5.21			
						other (L1 translations)	4	4.17						

Emergent V PREP chunks

Another emergent pattern across the learner expressions are verb + preposition chunks (see Tables 6-2 and 6-3).

For DEPOSITING MONEY the most frequent emergent pattern is V *on* (63% of all V PREP chunks), which corresponds with the V PREP pattern in L1 Dutch (V *op*).

For DONATING MONEY, *give to* is the most frequent (approx. 80% of all V PREP chunks), which shows effects of general frequency of L2 forms (*give to* is a fixed chunk in English).

Emergent $Obl_{path/loc}$ / Obj2

For both concepts, there are emergent patterns in the object (Tables 6-2 and 6-3). In DEPOSITING MONEY, the most frequent object ($Obl_{path/loc}$) is DET bank (75%). In DONATING MONEY, the most frequent Obj2 are various noun phrases (45.8%) of differing length and complexity; the second most frequent is *charity* (19.8%).

The emergent pattern in DEPOSITING MONEY shows no clear evidence of either L1 or L2 influence, since the lexical item *bank* has the same form in both L1 Dutch and L2 English. In DONATING MONEY, the emergent pattern *charity* is the target Obj2 for the CWOST (*give * to charity*); also, it does not directly map onto the L1 Dutch *goed doel* (*good purpose / cause*), so it is likely an effect of general frequency of L2 forms.

Emergent slot-frames

Apart from a few individual cases, most learner expressions can be grouped into more or less schematic slot-frames.

For DEPOSITING MONEY there are 6 emergent slot-frames (Figure 6-3). The most frequent is *put* NP *on* DET *bank* (25% of all expressions), which directly corresponds with L1 Dutch *zet* NP *op de* bank; three other slot-frames (*save* NP *on* DET *bank*, *set* NP *on* DET *bank* and *do* NP *on* DET *bank*) also show clear L1 Dutch influence. The CWOST slot-frame *put* NP *in the bank* occurs only twice as does another conventionalized slot frame *put* NP *in* DET *bank account.* So the emergent slot-frames for DEPOSITING MONEY seem to be influenced primarily by effects of L1 Dutch constructions.

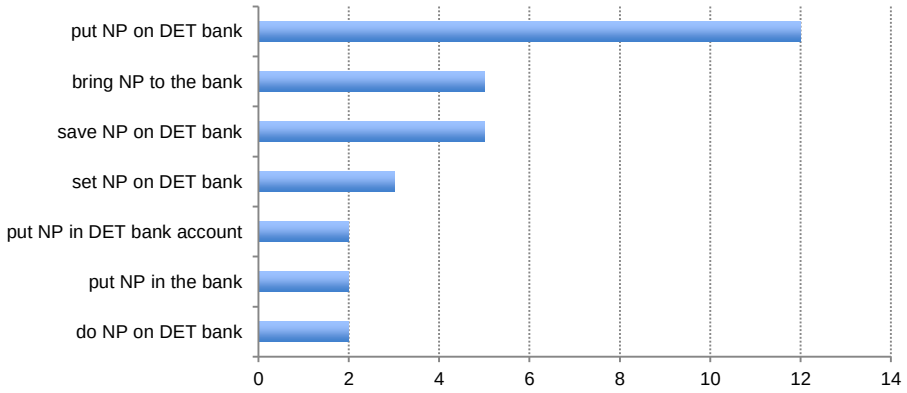


Figure 6-3: Frequency distribution of emergent slot-frames in learner expressions for DEPOSITING MONEY.

For DONATING MONEY there are also 6 emergent slot-frames (Figure 6-4). The most frequent is the general schema *give* NP *to* NP (37% of all expressions) – a frequent and prototypical VOO schema in L2 English. The CWOST slot-frame *give* NP *to charity* is the second most frequent emergent slot-frame across the learner expressions. So the emergent slot-frames for DONATING MONEY seem to be influenced primarily by frequency of L2 forms.

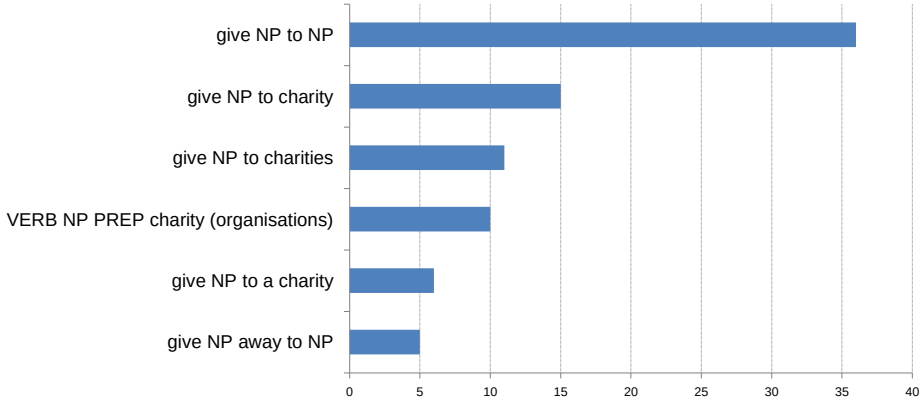


Figure 6-4: Frequency distribution of emergent slot-frames in learner expressions for DONATING MONEY.

Emergent low-level schema

When we generalize over the learner expressions for DEPOSITING MONEY, there is an emergent low-level schema V NP *on* NP underlying 56.3% of all expressions. The same schema underlies the L1 Dutch CWOSTs in the first person singular form (V NP *op* NP).

Emergent abstract constructions

Finally, there is also an emergent pattern at the most abstract level: most learner expressions for both concepts follow L2 English verb-argument constructions. 81% of all expressions for DEPOSITING MONEY follow the VOL construction, and 87,5% of all expressions for DONATING MONEY follow the ditransitive VOO (V Obj Obj2) construction (Tables 5 and 6 in Appendices). The same verb-argument constructions are also found in the English CWOSTs for the two concepts, so the emergent pattern could be interpreted as an effect of L2 forms. However, the L1 Dutch first person singular form for both concepts has the same verb-argument structure, so the pattern could also originate from the L1.

There are clear effects of abstract L1 Dutch verb-argument constructions in another emergent (but much less frequent) pattern: the reversed VOO and VOL; see example (1).

(1) a. learner expression *the rest of the money I would bring to the bank*
O V L

b. L1 Dutch *de rest van het geld zou ik naar de bank brengen*
the rest of the money would I to the bank $\text{bring}_{\text{INF}}$

The learner expression in (1) does not follow the L2 English VOL - but neither does it follow the exact L1 Dutch word order. Rather, there is an underlying Dutch OVL verb-argument structure filled with L2 English phrases (*the rest of the money / I would / bring to the bank*).

H3. Learner expressions at higher L2 proficiency levels will be CWOSTs or their close approximations; learner expressions at lower proficiency levels will be make-do solutions, showing effects of L1 Dutch.

The full lists of complete learner expressions ranked by L2 proficiency levels are presented in Tables 3 and 4 in the Appendices; tables 6-5 and 6-6 show emergent patterns in each proficiency level.

DEPOSITING MONEY

Individual cases of the L2 CWOST *put NP in the bank* are present in the two highest levels (5 and 6). The target V PREP combination *put in* emerges from level 5 on; the target Obj2 *the bank* occurs in all levels and is always the most frequent one. There are emergent patterns of clear L1 Dutch influence in verbs and V PREP (V *on)* up until level 5. There is also an emergent reversed VOL pattern in level 5, as well as individual cases in several other proficiency levels.

Table 6-5: DEPOSITING MONEY: Emergent patterns by L2 proficiency levels. Expressions in *italics* show a clear influence from L1 Dutch; underlined expressions are target L2 forms.

	verb(+prep)	N	Obl	N	emergent slot-frame	N
Level 1	*set op*	1	*the bank*	1		
N=1						
Level 2	*do on*	2	the bank	2	*do * on the bank*	2
N=5	*put on*	1	*my giro*	1		
	spare on	1	*my bankvault*	1		
	non-VOL	1				
Level 3	*put on*	5	the bank	5	*put * on the bank*	3
N=9	bring to	1	*saving account of my bank*	1		
	store	1	there [the bank]	1		
	save on	1				
	non-VOL	1				
	reversed VOL	1				
Level 4	*put on*	6	the bank	9	*put * on DET bank*	5
N=19	*set on*	3	my bank	4	*set * on my bank*	3
	bring to	3	a bank	2	bring * to the bank	3
	store	3	my bankaccount	1	*save * on the bank*	2
	save on	2				
	store in	1				
	save at	1				
	reversed VOL	1				
Level 5	*put on*	4	the bank	6	*put * on DET bank*	3
N=11	<u>put in</u>	3	my bank	1	<u>put * in my bank account</u>	2
	bring to	1	a bank	1		
	give to (VOO)	1	my bank account	2		
	reversed VOL	3	a bankacount	1		
Level 6	<u>put in</u>	2	<u>a savings acount</u>	1	<u>put * in NP</u>	
N=2			<u>the bank</u>	1		
(none)	put into	1	the bank	1		

DONATING MONEY

The L2 CWOST *give NP to charity* is present from level 4 on, with an emergent slot-frame from level 5 on. The target V PREP combination *give to* is the most frequent one in all levels; the target Obj2 *charity* occurs in all levels, but in the two highest levels (5 and 6) it is the most frequent one. There are individual cases of clear L1 influence in Obj2 up until level 4; also, there are individual cases of reversed VOO in several proficiency levels, including level 5.

Table 6-6: DONATING MONEY: Emergent patterns by L2 proficiency levels. Expressions in *italics* show a clear influence from L1 Dutch; underlined expressions are target L2 forms.

	verb(+prep)	N	Obj2	N	emergent slot-frame	N
Level 2	give to	7	NP	6	give NP to NP	6
N=11	give away to	1	charity	2		
	spend on	1	*a good doel*	1		
	give on	1				
	reversed VOO	1				
Level 3	give to	10	NP	8	give NP to NP	7
N=16	give away	1	charities	1		
	give away to	1	*a good cause*	1		
	spend out to	1	a good thing	1		
	make for	1	a good organisation	1		
	go to (VOL)	1				
	reversed VOO	1				
Level 4	give to	26	NP	15	give NP to NP	15
N=29	give away to	1	charities	6	give NP to charities	6
	spend on	1	a charity	4	give NP to a charity	4
	give on	1	charity	1		
			a good purpose	1		
Level 5	give to	24	charity	13	give NP to charity	11
N=33	give away to	3	NP	11	give NP to NP	8
	send to	2	a charity	2	give NP to a charity	2
	spend on		charities	2	give NP to charities	2
	put by		charity organisations	2		
	save for		a charity organisation	1		
			good organisations	1		
			a good organisation	1		
	reversed VOO	1				
Level 6	give to	5	charity	3	give NP to charities	3
N=7	use for	1	charities	3	give NP to charity	2
	spend on	1	a charity	1		

6.5. Discussion

Taking a usage-based perspective, this study analyzed in detail how Dutch learners of English express two beyond-word-level concepts (DEPOSITING MONEY and DONATING MONEY) in L2 English. The question was whether the conventionalized ways of expressing the concepts (the CWOSTs) are constructed as whole form-meaning mappings in L2 (i.e., as multi-word expressions mapping onto their beyond-word-level concepts); and if not, what form-meaning mappings for the two beyond-word-level concepts are constructed instead. I address each question separately.

a. Are conventionalized ways of saying things (CWOSTs) for selected beyond-word level concepts constructed as whole form-meaning mappings in L2?

The findings retrieved by WebCorp LSE show that the CWOSTs for the two selected concepts are VOL and VOO slot-frames with two most frequent instantiations (specific phrases). Taking a usage-based perspective we can assume that the acquisition of the two CWOSTs will start by establishing a conventionalized form-meaning mapping (i.e., the CWOST mapping onto the beyond-word-level concept), starting with the most frequent specific phrase, which over time will become generalized and productive as a slot-frame. Since the learners' written production provides a snapshot of the learners' linguistic development, it will likely also provide a snapshot of these expressions in one or more of their developmental stages. So from a usage-based perspective we might expect that if the learners attempt to express the concept of DEPOSITING MONEY, they will use the fixed phrases *put it in the bank, put money in the bank*, and/or the generalized slot-frame *put NP in the bank.* FOR DONATING MONEY we might expect the specific phrases *give the money to charity, give it to charity,* and/or the generalized slot-frame *give * to charity.*

Out of the 48 learner expressions referring to DEPOSITING MONEY there are two learner expressions matching the conventionalized slot-frame *put NP in the bank*. Out of the 96 learner expressions referring to DONATING MONEY, there are 15 learner expressions matching the slot-frame *give * to charity,* out of which three expressions match the frequent fixed phrase *give it to charity* and one expression matches the frequent fixed phrase *give the money to charity*. This means that all learners have in place the concepts of DEPOSITING MONEY and

DONATING MONEY, but not all learners use the conventionalized ways of expressing the concepts in L2 English. From a usage-based perspective this suggests that the two concepts were not acquired as part of L2, rather, that they were constructed as whole form-meaning mappings in the learners' L1 (that is, together with the corresponding L1 CWOSTs, most likely one or more of the L1 Dutch CWOSTs established in this study). This means that for the two beyond-word-level concepts the learners already have the L1 form (the CWOST) established in all its specificity; i.e., the underlying abstract verb-argument constructions, and the lexically specific occupants of each constructional island. When constructing the L2 CWOST, the learners are likely to draw on some aspects of the established L1 form-meaning mapping.

The difference between the two concepts in the number of CWOSTs could be the effect of general frequency of the English CWOSTs: *give * to charity* has a higher type- and token frequency as retrieved by WebCorp than *put NP in the bank,* so L2 learners are more likely to encounter the first phrase and it is more likely to "stick" than the second phrase. Also, because of the high type frequency the first phrase is likely to become established as a productive pattern. And indeed, the CWOSTs for DEPOSITING MONEY comprise only 4.2% of all learner expressions, while the CWOSTs for DONATING MONEY comprise 15.6%. Also, the slot-frame *give* NP *to charity* occurs across all proficiency levels, including the lowest (levels 2-6), with a range of slot fillers, whereas *put NP in the bank* only occurs in the two highest proficiency levels (5 and 6).

To conclude, while there is some evidence of the two CWOSTs in their developmental stages, these findings suggest that, in most learners in this study, the CWOSTs for the two beyond-word-level concepts were initially not constructed as whole form-meaning mappings in the L2. This is supported by the findings across the L2 proficiency levels: while the CWOSTs occur mostly in higher levels, their components already occur in lower levels, which may mean that the CWOSTs are constructed by fusion of their individual components as learners gradually acquire the component target form (as a function of frequency of the CWOST), rather than initially as whole form-meaning mappings.

b. What form-meaning mappings are constructed instead?

In order to address this question, the learner expressions were analyzed for emergent patterns of use that could show how learners build their linguistic solutions; this in turn could give some indications of what form-meaning mappings are constructed instead of the two English CWOSTs mapping on their beyond-word-level concepts.

The analysis has shown that 81% of the extracted learner expressions for DEPOSITING MONEY follow the basic structure of the L2 CWOST, the abstract VOL construction. Similarly, 87.5% of the extracted learner expressions DONATING MONEY follow the ditransitive VOO construction. Further analyses have revealed emergent patterns in the individual constructional islands of the two verb-argument constructions. However, since the emergent patterns also include expressions that do not follow the VOL and VOO exactly (such as the reversed VOL and VOO) and expressions which are true make-do solutions (such as *go settingh it op the bank*), it seems that the patterns are in fact emerging in the constituent meaning units of the beyond-word-level concepts.

In the concept of DEPOSITING MONEY there are three basic meaning units: PROCESS (transfer), THING (money) and LOCATION (the bank); similarly, in the concept of DONATING MONEY, there are again three basic meaning units: PROCESS (transfer), THING (money), RECEIVER (charity, person or entity)[20]. The findings show a variety of solutions for the meaning units - but since the learners are similarly affected by their entrenched L1 constructions and by the general frequency of L2 forms, they construct similar solutions for the same meaning units. The common form and structure of their solutions then give rise to emergent patterns at different levels of the expressions and of different degrees of schematicity.

About a half of the learner expressions for DEPOSITING MONEY use the verb *put* (45.8%), which is the most frequent and prototypical verb in English VOL (Ellis & Ferreira-Junior, 2009b); the rest of the expressions contain verbs which are semantically or formally influenced by L1 Dutch (*set, do, save* show semantic influence from L1 Dutch verbs *zet/zetten, doe/doen, spaar/sparen,* while *store* and *spare* show a formal similarity to *storten* and *sparen*). Although most of the L1 Dutch verbs in the Dutch CWOST are in principle semantic equivalents of the

[20] This study does not deal with the THING meaning unit as this is a variable slot in both conventionalized slot-frames in English (*put* THING *in the bank, give* THING *to charity*).

English *put,* it is still the one most preferred, most likely because of the L2 frequency / prototypicality effects. Most of the verbs then combine with the preposition *on*, which gives rise to an emergent slot-frame V *on*. So the meaning unit PROCESS is most often expressed by some variation on the slot-frame V *on*, which corresponds with the L1 Dutch frame V *op*. The most frequent expression for LOCATION is DET *bank*, which together with expressions for PROCESS gives rise to an emergent slot-frame *put* NP *on* DET *bank* (occurring in 25% of all learner expressions) - or, an even more general slot-frame V NP *on* DET *bank* (45.84% of all expressions). When we generalize over the L1 Dutch CWOSTS, we get the abstract schema V NP *op* DET *bank* - this means that the abstract schemas emerging across the learners' L2 English expressions and the L1 Dutch CWOSTs are semantic equivalents.

For PROCESS in DEPOSITING MONEY the majority of expressions contain the verb *give* (82%), which is the most frequent and prototypical verb in English VOO (Ellis & Ferreira-Junior, 2009b); moreover, 77% of all expressions contain the target V PREP combination *give to*, most likely as a result of its frequent occurrence as a fixed chunk (also, the L1 Dutch *geef aan / geven aan* is not a direct semantic equivalent). For the meaning unit RECEIVER about a half of all expressions have various noun phrases (46%) of different lengths and complexity, which more or less accurately describe the concept of charity; and the target *charity* (20%) is the second most frequent. The emergent slot-frames for DONATING MONEY are the generally frequent and prototypical low-level schema *give* NP *to* NP (38%) and the target slot-frame *give* NP *to charity* (16%).

Some of the learner solutions for the individual meaning units are more advanced than others in terms of how well they approximate the English CWOSTs. In this sense the expressions form a continuum: expressions at one end are very close to L1 Dutch (and therefore lower on the L2 proficiency scale), while at the other are expressions equal to the CWOSTs or their close approximations (and therefore higher on the L2 proficiency scale). Some expressions are target-like (*give to charity, put in the bank*), some show a clear L1 influence (*good doel, good purpose, put on the bank*) but some are true make-do solutions, in that they are assembled from available L2 resources and L1 constructions (*a good organization, a good thing, put NP by charity, go settingh it op de bank,* etc.)

For DEPOSITING MONEY, there is a continuum in the PROCESS meaning unit (Figure 6-5), as different learners are drawing on their L1 constructions for the process of depositing money.

For DONATING MONEY, there is a continuum in the RECEIVER / CHARITY meaning unit, (Figure 6-6) as different learners are drawing on their L1 constructions for the concept of charity.

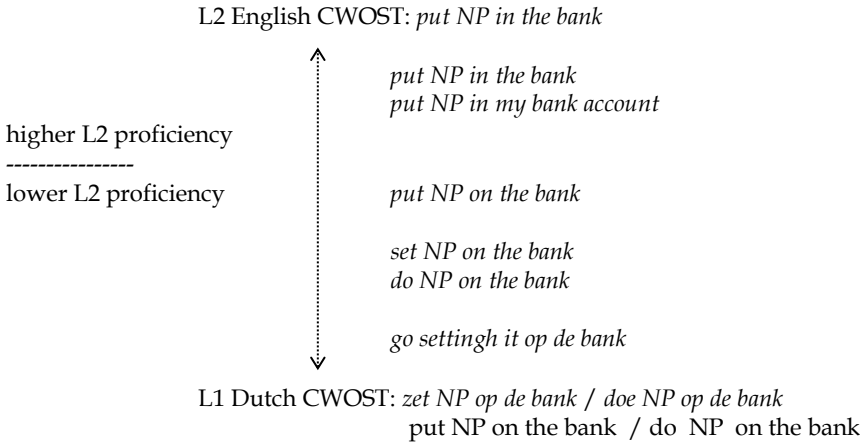


Figure 6-5: L1 Dutch – L2 English continuum of learner expressions for the concept of DEPOSITING MONEY.

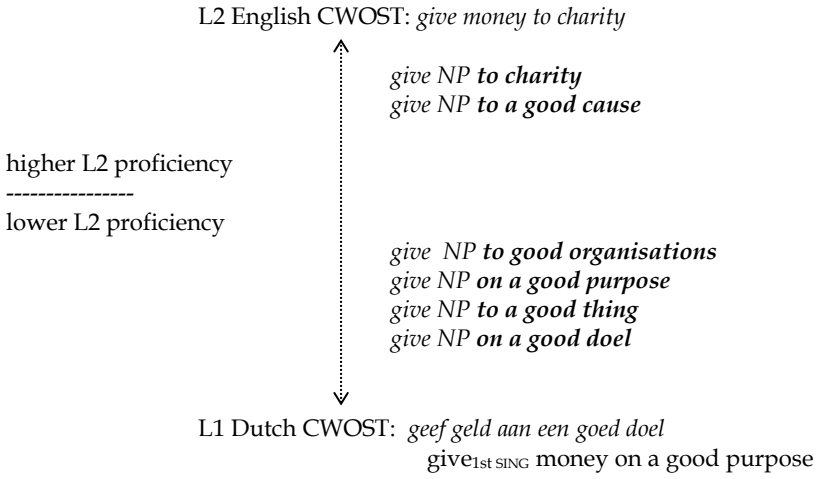


Figure 6-6: L1 Dutch – L2 English continuum of learner expressions for the meaning unit of RECEIVER.

The findings suggest that learners break the beyond-word-level concepts down into their constituent meaning units, construct a linguistic solution for each meaning unit – thus creating constituent form-meaning mappings; these are then pasted in the correct slots of an L1 or L2 verb-argument construction in order to assemble the whole expression. The exact forms mapped onto the constituent meaning units are highly dependent on the L2 resources each learner has available and how much they draw on their entrenched L1 constructions, so most of the constituent form-meaning mappings are in some sense make-do solutions. This is clearly visible in the learner expressions for DONATING MONEY, where one part of the expression may be target-like while the other part may show strong L1 influence (e.g., *give money* ***on a good doel***), as well as in the wide variety of noun phrases used for the RECEIVER meaning unit.

To conclude, the form-meaning mappings for the two beyond-word-level concepts (DEPOSITING MONEY and DONATING MONEY) appear to be constructed for the constituent meaning units, rather than for the whole beyond-word-level concept. This also confirms the earlier impression that the L2 CWOSTs are gradually constructed by fusion of their constituent form-meaning mappings, rather than initially as whole form-meaning mappings.

6.6. Study limitations and future research

The conclusions regarding quantitative differences between the two concepts and the individual L2 proficiency levels should be seen as tentative, since the numbers of expressions for the two concepts and for the L2 proficiency levels differ. This is an unfortunate trade-off in the naturally occurring, emergent data used in this study: although all learners participating in the study wrote on the same topic, not all of them chose to express the two beyond-word-level concepts; and the group of learners who did was not balanced in terms of L2 proficiency levels. This opens up possibilities for future studies in terms of tackling the data collection challenge; i.e., how to elicit learner expressions referring to the same beyond-word-level concept used in their natural textual environment, without influencing the learners' word choice in the process.

6.7. Conclusion

The aim of this study was to investigate whether two selected L2 CWOSTs (conventionalized ways of saying things) mapping onto two beyond-word-level

concepts (DEPOSITING MONEY and DONATING MONEY) are constructed as whole form-meaning mappings in L2, as evidenced in L2 learners' written production. Emergent patterns across the learner expressions suggest that learners break down the whole beyond-word-level concept into its constituent meaning units, which are concept-based rather than word-based, find a linguistic solution for the constituent meaning units and then paste these in L1 or L2 abstract constructions. Similarly, as they reach higher L2 proficiency, learners gradually construct CWOSTs as they acquire the target forms for their constituent meaning units. The process is strongly influenced by the type- and token frequency of the CWOST as well as by general frequency of L2 forms, and by entrenched L1 constructions. So unlike in L1 where the mapping of form onto meaning is assumed to be holistic, in L2 the process may be more analytical. Rather than treating the beyond-word-level concept as a whole semantic unit and directly mapping the conventionalized form (the CWOST) onto the beyond-word-level concept like L1 users are assumed to do, L2 learners establish partial "make-do" form-meaning mappings which are the result of a complex interplay of entrenched L1 constructions and available L2 resources.

Chapter 7
Conclusions

The aim of this dissertation was to investigate chunks in L2 development from a usage-based perspective in written L2 English produced by young Dutch L2 learners in high- and low-input conditions. In order to answer questions related to chunk development from a usage-based perspective, four related studies were carried out.

7.1. Chunk development in high- and low-input learners

Firstly, we were interested in effects of greater exposure to L2 input on L2 learners' development of chunks over time. Moreover, since chunks in written texts are difficult to capture and there may be individual differences in the learners' use of chunks, an additional question was what chunk measures best capture the potential differences between high- and low-input learners. These questions were addressed in the first study (Chapter 3: Smiskova & Verspoor, in press). The study was cross-sectional and focused on potential differences between the two groups at two points in time: when they started in their respective educational streams and 2.5 years later. The trends at group level were then illustrated by two case studies of individual development of two selected learners (one high- and one low-input learner), whose use of chunks over time was representative of their respective input groups. Taking an integrated approach[21] to chunks in L2, we developed a suitable method of identification of multi-word units in written L2 data. We also introduced a

[21] Proposed by Granger & Paquot (2008), combining insights from phraseological and frequency-distributional approaches.

number of other measures of chunk use in text, which helped capture some crucial differences between high- and low-input learners.

In line with usage-based perspectives where input is crucial for successful L2 development, we found that L2 learners in high input conditions were more successful in their development of native-like chunks than low-input learners. Two chunk measures distinguished best between high- and low-input learners: *number of chunk types per text* and *percentage of chunk-words per text*. These measures showed that high-input learners developed a significantly greater range of chunk types than low-input learners, and 46% proportion of chunk-words per text, both of which are characteristic of native-speaker language (see Erman & Warren, 2000). From a usage-based perspective, the most important finding was the significant difference between high and low-input learners in the use of one chunk type, namely *"preferred ways of saying things"*.

On the basis of the findings we argued that high and low-input learners develop L2 English chunks differently, which is then reflected in their use of L2 English on the whole: in general, high-input learners' use of English is more fluent and authentic than low-input learners'. We also argued that "preferred ways of saying things" should be studied in more detail for three reasons: (a) they were one of the distinguishing measures between high- and low-input learners, (b) they do not fit traditional approaches to language structure and therefore are difficult to capture in written L2 data, and (c) they are compatible with usage-based, cognitive-constructionist theories.

7.2. Dynamic aspects of chunk development

Secondly, we were interested in the dynamics of chunk development over time in high- and low-input learners, especially in the role of variability in the process. This question was addressed in the second study (Chapter 4; Verspoor & Smiskova, 2012). Building on the findings of Study 1, this study provided important additional insights in that it zoomed in on the dynamics of individual development, which are often averaged out by using traditional statistics. The study was longitudinal and microgenetic, tracking the development of chunks in one low-input and one high-input learner, each selected as representative of their respective input groups. We plotted the developmental curves of several different chunk types to show how they interact in their development over time. Then we used DST visualization and analytical techniques (Verspoor, de Bot, & Lowie, 2011) to analyze the learners'

developmental trajectories. We found that the high-input learner's trajectory had periods of increased variability which over time showed a narrowing bandwidth. At the end of the study, the high-input learner's chunk use stabilized at a level developmentally higher than at the beginning of the study. The low-input learner, on the other hand, had less variability without a narrowing bandwidth. On the bases of our analyses we argued that the high-input learners' variability is meaningful, while the low-input learners' variability is more random. From a dynamic usage-based perspective, such differences in variability contribute to differences in chunk development: the meaningful variability in the high-input learner results in more successful chunk development than that in the low-input learner.

7.3. Conventionalized ways of saying things (CWOSTs)

The third study (Chapter 5; Smiskova, Verspoor, & Lowie, 2012), followed up on the findings of the first study (Chapter 3; Smiskova & Verspoor, in press), namely, the significant difference between the two input groups in the use of "preferred ways of saying things" and the need for further research of this type of multi-word units. As these expressions do not easily fit traditionally recognized language subsystems (grammar, lexicon, phraseology), they are not paid enough attention in L2 research. Still, the phenomenon has been recognized by a number of researchers from different fields as the preferred expression of a certain notion out of all the ways permissible by the grammar and lexicon of the language as traditionally described. We took a Cognitive Linguistics approach (Langacker, 2008a, 2008b) and argued that "normal ways of saying things" can be understood as conventionalized form-meaning-function mappings: "normal" defined as conventionalized, "ways of saying" as the form, "things" as concepts or notions. We applied this definition to our written L2 learner writings and extracted all the different ways of expressing the same notion. Then we used two measures of conventionalization, frequency of occurrence and native speaker judgment of naturalness in order to identify *conventionalized ways of saying things* (CWOSTs) as opposed to *awkward ways of saying things* (AWSTs) in the learners' L2 English (compare *when I grow up* and *when I am a grown up adult*). The findings showed that CWOSTs can in principle be defined as linguistic units and are a very relevant aspect of L2 - and as such should be included in L2 research. However, we also concluded that measures of conventionalization need further refinement due to the intricate relationship

between frequency of occurrence and conventionalization (frequency as both the result and the driver of conventionalization); also, that in order to identify the conventionalized way of expressing a notion, the notion must be very narrowly defined.

7.4. Establishing chunks as L2 form-meaning mappings

Finally, we were interested in how learners establish L2 chunks as form-meaning mappings, focusing on the role of their L1 Dutch together with L2 frequency. This question was addressed in the last study (Chapter 6; Smiskova-Gustafsson, under review), which was a follow-up on the third study (Chapter 5; Smiskova, Verspoor, & Lowie, 2012) in that it focused on CWOSTs.

Taking a cognitive-constructionist perspective, this study investigated whether L2 learners construct CWOSTs as whole form-meaning mappings as L1 users are expected to do. Since L2 learners already have conventionalized form-meaning mappings established in their L1, they may have difficulties constructing L2 form-meaning mappings. As a result, L2 learners may not have the CWOST for a certain concept available. To express the concept in their L2, learners may have to construct linguistic "make-do solutions". The study investigated how Dutch L2 learners of English construct L2 form-meaning mappings for two beyond-word-level concepts: DEPOSITING MONEY (put NP *in the bank,* V Obj Oblpath/loc) and DONATING MONEY (give NP *to charity,* V Obj Obj2). The findings showed emergent patterns at different levels of the learner expressions, and of different degrees of schematicity (words - slot-frames - VACs). The emergent patterns indicated that learners do not treat a beyond-word-level concept holistically as a complete semantic unit for which there is a conventionalized expression in the L2. Rather, they first break down the beyond-word-level concept into its constituent meaning units (e.g., PROCESS, THING, LOCATION), then draw on their entrenched L1 constructions and available L2 resources to build a linguistic solution for each unit, thus creating constituent form-meaning mappings. Finally, the learners paste the constituent form-meaning mappings into the appropriate slots in abstract verb-argument constructions (both L1 Dutch and L2 English). The study concluded that, unlike in L1, the construction of CWOSTs in L2 may be an analytical, top-down process, which is heavily influenced by entrenched L1 constructions and available L2 resources.

7.5. Contribution and future research

I see the main contribution of this dissertation in that it is theoretically grounded within a dynamic usage-based theory and takes a data-driven approach. This helps identify important aspects of chunk development in L2 learners, and contributes to methods of definition and identification of chunks.

Usage-based theories help address perhaps the most important question in the research on chunks: what counts as a chunk in L2 data in relation to native-like standards. I propose that this can be a matter of distinction between *conventionalized ways of saying things* (CWOSTs) and *awkward ways of saying things* (AWSTs), a notion that is in line with cognitive-constructionist theories. Therefore, when identifying chunks in written L2 a *concept-first approach* may be suitable: first, identify the concept (i.e., what the learners want to say); next, isolate the expression mapping onto the concept (i.e., how the learners say it); and finally, determine if the expression is a CWOST using established chunk categories, researcher intuition, and/or other measures of conventionalization. A concept-first approach has two main advantages when it comes to identifying chunks in written L2 data. Firstly, it captures word sequences that are traditionally recognized as fixed expressions (e.g., *heavy rain*) as well as word sequences that may traditionally be seen as arbitrary word combinations but that are in fact conventionalized (e.g., *when I grow up*). This helps identify important aspects of L2 development and crucial differences between learners in different input conditions. Secondly, a concept-first approach can eliminate identification problems such as unclear borders and nesting (e.g. *[[The only thing] I [know [for sure]]]*) because it takes meaning as a starting point. This way, the researcher's attention is taken away from the form, which is associated with language subsystems that are traditionally seen as separate (such as grammar, lexicon, phraseology) but from a dynamic usage-based perspective are in fact emergent, which may complicate chunk identification. This is also related to questions of validity and reliability, which in my opinion should be addressed by future research on chunks in L2 development. Established approaches such as traditional phraseological and frequency-distributional approaches use well-tested methods to identify chunks reliably (such as semantically opaque phrasemes, or *n*-grams that fit within set frequency and MI thresholds) – and indeed, their well-established insights and techniques have provided a crucial point of departure for the study of chunks in this dissertation. However, these approaches alone may not capture relevant aspects of L2 development. A

concept-first approach as introduced in this dissertation may be more valid because it is grounded in linguistic theories that see language as part of cognition; however, the procedure needs to be more rigorous. For instance, as recommended in the third study (Chapter 5; Smiskova, Verspoor, & Lowie, 2012), methods for narrow specification of concepts and measures of conventionalization should be developed further so they are more reliable.

Nonetheless, this dissertation has shown that a dynamic usage-based approach offers a useful perspective on chunks in L2 development. The definition of chunks as conventionalized L2 form-meaning mappings leads to certain usage-based assumptions about how they will be acquired by learners of the L2, which in turn helps generate research questions that can lead to important insights not only into chunks in L2 development, but into L2 development in general.

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Appendices

Table 1: Typology of chunks (closely based on Granger & Paquot 2008, pp. 43-44).

1. Chunk types with a referential function	
1.1 Chunks a word- and phrase level	
a. Compounds	*sunbathing, two-week holiday, ice-cream* - are made up of two elements which have independent status outside these word combinations. They can be written separately, with a hyphen or as one orthographic word.
b. Lexical collocations	*heavy rain, take a dive, strong current, pretty hard, real close, og wrong, hurt badly* - are strings of specific lexical items that co-occur with a mutual expectancy higher than chance and have a semantic dependency relationship. They show compositional structure and do not have pragmatic functions. The base of a collocation is selected first by a langauge user for its independent meaning. The second element is semantically dependent on the base. One collocation can be embedded in another, as in (take((strong measures)).
c. Grammatical collocations: Particles	*afraid of, involved in, at school, in English* - are restricted combinations of a lexical word and a grammatical word.
d. Grammatical collocations: Complements	*avoid -ing, necessary to, want/going/have/manage to, go -ing, keep -ing, would like to, be able to, know CLAUSE, say that CLAUSE* - are restricted combinations of a lexical word and a complement structure (infinitive, gerund, reflexive pronoun, nominal sentence)
e. Phrasal verbs	*blow up, make out, crop up* - are combinations of verbs and adverbial particles that can have varying degrees of non-compositionality.
f. Idioms	*to spill the beans, to let the cat out of the bag, to bark up the wrong tree* - are constructed around a verbal nucleus and characterized by their semantic non-compositionality, lack of flexibility, and/or marked syntax.
g. Similes	*as old as the hills, to swear like a trooper* - are stereotyped comparisons typically consisting of sequences following the frames *as ADJ as (DET)NOUN, VERB like a NOUN*
h. Irreversible bi- and trinominals	*bed and breakfast, kith and kin, left, right and centre* - are fixed sequences of two or three word forms belonging to the same part-of-speech category and linked by the conjunctions *and, or*
i. Structures	*even ADJ -er than, as ADJ as, a year ago, two meters high* - are short slot-fillers containing one or more free slots for a lexical item
j. Variable idioms	*pay a price for -ing, end up -ing* - are to some degree idiomatic and have a slot (see Stefanowitsch & Gries, 2003, p. 222)

1.2. Chunks at clause- and sentence level

k. Constructions	*the sooner we are finished, the sooner we can go* - are longer slot-fillers containing one or more free slots for a phrase or a clause
l. Preferred ways of saying things: Conventionalized sentence stems	*one thing I know for sure is CLAUSE, all they can do is VERB/CLAUSE* - are clauses or their fragments whose grammatical form and lexical content is wholly or largely fixed. Their fixed elements form a standard label for a culturally recognized concept.
m. Preferred ways of saying things: Conventionalized sentences	*It's hard to explain. I'm just who I am. There are more important things in life.* - are sentences whose grammatical form and lexical content is wholly or largely fixed. Their fixed elements form a standard label for a culturally recognized concept.

2. Chunk types with a textual function

2.1. Chunks at word- and phrase level

n. Textual prepositions	*in addition to, apart from* - are grammaticalized combinations of simple prepositions with a noun, adverb or adjective
o. Textual conjunctions	*so that, as if, even though* - are grammaticalized sequences functioning as complex conjuctions
p. Textual adverbials	*in other words, last but not least, more accurately, what is more, however,* - are linking chunks such as polywords, grammaticalized prepositional phrases, adjectival phrases, and adverbial phrases.

2.2. Chunks a clause level

q. Textual sentence stems	*another thing is CLAUSE, it will be shown that CLAUSE* - are routinized fragments of sentences with specific textual or organizational functions and typically involve a subject and a verb.

3. Chunk types with a communicative function

r. Speech act formulae	*Good morning, Take care, You're welcome, Why don't we* (suggesting), *That's all* (concluding) - are preferred ways of performing certain functions such as greetings, compliments, and invitations.
s. Attitudinal formulae and sentence stems	*in fact, to be honest, it is clear that* - are used to signal speakers' attitudes towards their utterances and interlocutors.
t. Proverbs and proverb fragments	*When in Rome* - express general ideas by means of non-literal meaning such as metaphors, metonymies, etc., and are equivalent to complete sentences but often abbreviated.
u. Commonplaces	*it's a small world, we only live once, the sky is the limit* - are non-metaphorical complete sentences expressing tautologies, truisms and sayings based on everyday experience.
w. Slogans	*Make love, not war.* - are short directive phrases made popular by their repeated use in politics or advertising.

Table 2: Statistical analyses of chunk measures in a cross-sectional study (*significant at the 0.05 level; **significant at the 0.001 level).

Chunk measures	Oct 07 means indep. samples t-test (α=0.05)		May09 means indep. samples t-test (α=0.05)		Effects (P-values) repeated measures ANOVA α=0.05		
	High-input	Low-input	High-input	Low-input	time	group	time/group
chunk types/text	4.0 SD 2.45	3.45 SD 1.86	7.0** SD 0.89	4.55 SD 1.86	.000	.036	.036
% chunk-words/text	26.8* SD 16.28	12.40 SD 7.29	45.60* SD 9.82	33.2 SD 10.49	.000	.002	.652
chunks/ 100 words	10.62* SD 5.64	4.97 SD 2.51	14.29 SD 2.15	12.96 SD 3.74	.000	.011	.046
mean chunk length/text	1.65 SD 0.89	1.02 SD 0.56	3.13* SD 0.40	2.60 SD 0.40	.000	.005	.760
type-token lex.col/100 words	2.62 SD 1.94	1.15 SD 1.09	3.26 SD 1.75	4.02 SD 2.95	.006	.599	.063
type-token compl/100 words	1.16 SD 2.02	0.26 SD 0.44	3.15 SD 1.20	4.75 SD 3.10	.000	.562	.041
type-token conv.sent stem/100 words	0.25 SD 0.55	0.05 SD 0.17	2-07 SD 1.11	0.56 SD 0.81	.000	.002	.004
mean text length	65.09 SD 20.23	114.18* SD 42.83	157.72* SD 39.26	103.00 SD 35.45			
Pearson correlation text length/chunks	.612*	.146	.867**	.726*			

Table 3: Learner expressions for DEPOSITING MONEY: full list ranked by L2 proficiency levels.

Level 1	go settingh it op the bank
Level 2	do it on the bank
	do money on the bank
	put it on my giro
	spare it on my bankvault
	develop an account with an own name
Level 3	put everything on the bank
	go to the bank and put 800 euros on it
	poot my mony on the bank
	put 500 euro on the bank for later
	With the money, that is over, I'll bring it to the bank
	put it on a saving account of my bank
	go to the bank and store it there
	save the half of the money an the bank
	The rest of my money goes to the bank
Level 4	put it on the bank
	put it on the bank
	put it on a bank
	put it on the bank.
	put it on my bank
	put the money on my bankaccount
	set 950 euros on my bank
	set lesser money on my bank
	set it all on my bank
	bring it to the bank
	bring it to the bank
	bring it to the bank
	store it in a bank
	(the best option is to) store it
	(it is the best to) store it
	the rest of the money I would store
	save the other money on the bank
	save it on the bank
	save the money at the bank
Level 5	put the half of my money on a bank.
	put the rest on my bank
	put more than 1500 Euro on the bank
	the rest I would bring to the bank
	the rest I would bring to the bank, to save
	put it in my bank account
	put most of it on a bankacount
	the rest of the money I will put in the bank
	give it to the bank
	take some of it and bring it to to the bank
	put it in my bank account
Level 6	put something like 150 euros in a savings acount
	put some of it in the bank
none	go to the bank and I put the money into the bank

Table 4: Learner expressions for DONATING MONEY: full list ranked by L2 proficiency levels.

Level 2	give the money to charity
	give much money to the church
	give a lot of money to a organisation foor animals and little childeren, they haven`t parents any more
	the money that I have left I will give to poor people
	give poor people something
	give a couple of euro's to pour children
	give the mony to childeren, childeren with no mony no home and por childeren
	give all the money ti to the children in afrika
	give allot away from the money to some children wo really need it
	spend some money on charity
	give some money on a good doel
Level 3	give some money to charities, charities to help children
	give some to an organsation like stichting de opkikker
	give my mony to people en animals who have it not good
	give also some money to pour peaple in Africa
	give it to some poor kids in Africa
	give some money to children who don`t have enough food or money
	give the most to pour people
	give also some money to the pour peaple, in Afrika
	give the money away
	give some money away to poor people
	spend out money to WNF or something else
	a part of it i would give to a good cause
	give a little bit of that money to a good thing. Afrika our Asie.
	make a donation for the WWF
	donate
	a lot of my money shall goes to a good organisation
Level 4	give a part to charities
	give money to charities
	give some to charities
	give 100 euros to charities and other kind-heart things
	giving some money to charities
	giving some money to charities
	give something to charity
	give some money to a charity
	give some money to a charity
	give it to a charity
	give some money to a charity for the children in Ghana
	give a bit to Greenpeace or WWF
	give a bit to the wnf or War-child
	give some money to green peace
	give it to a foundation before war childs
	give some money to the church
	give it to a foundation for war childs
	give it too to a animal foundation
	give some of the money to the poorer people
	give et least 10% to the pour people
	give money to people who have shortage of money and can`t live anymore with the money they have.
	give some money to the poor
	give the money to the people in the third world
	give it to the poor and to the people who don`t have a job
	give it to the poor people in Africa
	give it to a poor family that I know
	give something away maybe to an organization who helps other people
	spend the money on Unicef
	give some euros on a good purpose

Level 5	give money to several charities
	give a part to charity
	give it to charity
	give something to charity
	give half the money to charity
	give half of it to charity
	give it to charity
	give a part of it to charity
	give the rest of the money to charity
	give some of the money to charity for example War Child or WNF
	give it to charity
	have given money to charity
	give some money to a charity
	give about 200/300 euros to a charity
	give some money to charity organisations
	give a bit to a charity organization
	give some money to War-Child and KIKA
	give some to foundations
	give mcuh money to a good incorpation that makespoor child go to school and kind of that thing
	give a part to important companies for the right development of poor countries
	give a lot to the poorer people
	give money to others who need it
	help people by giving them some of my money
	give it away to a charity like Unicef, Kika or War-Child
	give everything away too the poorer people
	the other half I would spend on charity
	put some money by charity organisations
	save some money for charity
	send it to poor children
	send something to charities
	give some money to good organisations like: ZOA or an organisation that give help to poor countries
	a good organisation would get some of the money
	give some of it to the poor countries
Level 6	give some of it to charities
	give money to charities
	give a lot of money to charities
	give some money to charity
	giving some money to charity
	use some of the money for a charity
	spend it on charity

Table 5: Learner expressions for DEPOSITING MONEY: the VOL construction (V Obj $Obl_{path/loc}$).

no.	V	Obj	$Obl_{path/loc}$
1	put	it	on the bank
2	put	it	on the bank
3	put	it	on the bank
4	put	everything	on the bank
5	put	more than 1500 Euro	on the bank
6	poot	my mony	on the bank
7	put	500 euro	on the bank
8	put	the half of my money	on a bank
9	put	it	on a bank
10	put	the rest	on my bank
11	put	it	on my bank
12	put	800 euros	on it [the bank]
13	set	950 euros	on my bank
14	set	lesser money	on my bank
15	set	it all	on my bank
16	do	it	on the bank
17	do	money	on the bank
18	bring	it	to the bank
19	bring	it	to the bank
20	bring	it	to the bank
21	bring	it	to the bank
22	bring	it	to to the bank
23	put	it	in my bank account
24	put	it	in my bank account
25	put	something like 150 euros	in a savings account
26	put	the money	on my bankaccount
27	put	it	on a saving account of my bank
28	put	most of it	on a bankacount
29	save	the other money	on the bank
30	save	it	on the bank
31	save	the half of the money	an the bank
32	save	the money	at the bank
33	settingh	it	op de bank
34	store	it	in a bank
35	store	it	there
36	put	some of it	in the bank
37	put	the money	into the bank
38	put	it	on my giro
39	spare	it	on my bankvault

Table 6: Learner expressions for DONATING MONEY: the VOO [V Obj Obj2] construction.

no.	V	Obj	Obj2
1	give	a part	to charity
2	give	it	to charity
3	give	the money	to charity
4	give	something	to charity
5	give	half the money	to charity
6	give	half of it	to charity
7	give	it	to charity
8	give	something	to charity
9	give	it	to charity
10	give	a part of it	to charity
11	give	the rest of the money	to charity
12	give	some money	to charity
13	give	some of the money	to charity for example War Child or WNF
14	have given	money	to charity
15	give	some money	to charities, charities to help children
16	give	a part	to charities
17	give	money	to charities
18	give	some	to charities
19	give	money	to several charities
20	give	some of it	to charities
21	give	money	to charities
22	give	a lot of money	to charities
23	give	100 euros	to charities and other kind-heart things
24	give	some money	to a charity
25	give	some money	to a charity
26	give	it	to a charity
27	give	some money	to a charity
28	give	about 200/300 euros	to a charity
29	give	some money	to a charity for the children in Ghana
30	give	some money	to charity organisations
31	give	a bit	to a charity organization
32	give	a bit	to Greenpeace or WWF
33	give	some money	to War-Child and KIKA
34	give	a bit	to the wnf or War-child
35	give	some money	to green peace
36	give	it	to a foundation before war childs
37	give	some money	to the church
38	give	much money	to the church
39	give	some	to foundations
40	give	a lot of money	to a organisation foor animals and little childeren, they haven't parents anymore
41	give	some	to an organsation like stichting de opkikker
42	give	it	to a foundation for war childs
43	give	it	too to a animal foundation
44	give	much money	to a good incorpation that makespoor child go to school and kind of that thing
45	give	a part	to important companies for the right development of poor countries
46	give	my mony	to people en animals who have it not good
47	give	some of the money	to the poorer people
48	give	some of it	to the poor countries
49	give	a lot	to the poorer people
50	give	money	to others who need it
51	give	a couple of euro's	to pour children
52	give	also some money	to pour peaple in Africa
53	give	the mony	to childeren, childeren with no mony no home and por childeren
54	give	all the money	ti to the children in afrika
55	give	it	to some poor kids in Africa
56	give	some money	to children who don't have enough food or money
57	give	the most	to pour people
58	give	at least 10%	to the pour people
59	give	money	to people who have shortage of money
60	give	some money	to the poor
61	give	the money	to the people in the third world
62	give	it	to the poor and to the people who don't have a job
63	give	it	to the poor people in Africa
64	give	it	to a poor family that I know
65	give	also some money	to the pour peaple, in Afrika
66	give	something	away maybe to an organization who helps other people
67	give	a lot [from the money]	away [to some children wo really need it]
68	give	it	away to a charity like Unicef, Kika or War-Child
69	give	some money	away to poor people
70	give	everything	away too the poorer people
71	spend	it	on charity

72	spend	some money	on charity
73	spend	the money	on Unicef
74	put	some money	by charity organisations
75	send	something	to charities
76	save	some money	for charity
77	use	some of the money	for a charity
78	send	it	to poor children
79	spend out	money	to WNF or something else
80	give	some money	on a good doel
81	give	some euros	on a good purpose
82	give	a little bit of that money	to a good thing
83	give	some money	to good organisations like ZOA
84	make	a donation	for the WWF

List of abbreviations

ADJ	adjective
AWSTs	awkward ways of saying things
BNC	British National Corpus
BYU	Brigham Young University
CEFR	Common European Framework of Reference
CITO	Centraal Instituut voor Toetsontwikkeling
COCA	Corpus of Contemporary American English
CWOSTs	conventionalized ways of saying things
DET	determiner
DST	Dynamic Systems Theory
DUB	dynamic usage-based
MI	mutual information
NP	noun phrase
NS	native speaker(s)
Obj	object
$Obl_{path/loc}$	locative
OTTO	Onderzoek Tweetalig Onderwijs
PREP	preposition
RQ	research question
TTO	Tweetalig Onderwijs
UB	usage-based
V	verb
VAC	verb-argument construction
VOL	Verb Object Locative
VOO	Verb Object Object (ditransitive)
VP	verb phrase
WebCorpLSE	WebCorp Linguist's Search Engine

Nederlandse samenvatting

Dit proefschrift gaat over het leren van "chunks" in een tweede of vreemde taal (T2), in dit geval het Engels. Chunks zijn uitdrukkingen die uit een relatief vaste combinatie van meerdere woorden bestaan zoals *of course*, *to grow up*, of *the sky is the limit*. Chunks komen vaak voor in taal en om een hoog niveau te bereiken in de T2 moeten leerders een groot aantal van deze chunks verwerven. Om de verwerving van chunks te verklaren, wordt in dit proefschrift een usage-based (UB) benadering genomen die stelt dat frequentie van voorkomen een van de belangrijkste factoren bij taalverwerving is. Daarom zullen T2-leerders die voldoende bloot gesteld worden aan authentiek taalgebruik chunks, net als allerlei andere aspecten van taal, kunnen verwerven. Maar toch is voor T2-leerders de verwerving en het gebruik van native-achtige chunks niet makkelijk om een aantal redenen. Ten eerste, krijgen de meeste T2-leerders niet genoeg blootstelling aan authentiek taalgebruik. Daarnaast richten T2-leerders, mogelijk als gevolg van instructie in het reguliere onderwijs waar de aandacht vaak gericht is op grammatica en vocabulaire, zich voornamelijk op het leren van afzonderlijke woorden en niet op de combinatie van woorden in chunks. Bovendien zijn sommige chunks niet voldoende frequent of relevant voor de T2-leerder. Naast een reeks van korte, vaste combinaties zoals *of course*, *to grow up*, en *the sky is the limit*, zijn er ook langere combinaties die ogenschijnlijk niet helemaal als vaste uitdrukkingen fungeren en die daarom voor een T2-leerder moeilijk te herkennen zijn als een chunk. Dit zijn uitdrukkingen die zo gangbaar zijn dat native speakers ze weer vaak gebruiken om iets uit te drukken zoals *when I grow up* in plaats van *when I am a grown up adult*. Omdat ze lang zijn, kunnen chunks ook moeilijk te onthouden zijn. Ten slotte kan het

leren van chunks in een vreemde taal ook worden beïnvloed door de kennis van de moedertaal. Het gevolg kan zijn dat een T2-leerder op een correcte manier de grammatica regels en woorden gebruikt van de T2, maar zich toch op een onhandige manier uitdrukt door het verkeerd gebruik van chunks.

Vanuit een UB-perspectief wordt een chunk gezien als een geconventionaliseerde correspondentie tussen een vorm en een betekenis, in de literatuur een "form-meaning mapping" genoemd en dat heeft belangrijke implicaties voor de studie van chunks in T2-ontwikkeling. Ten eerste, zijn er bij UB-gebaseerde benaderingen geen strikte grenzen tussen de traditionele taal subsystemen als grammatica, lexicon, en fraseologie omdat de taal wordt gezien als één gestructureerde inventaris van geconventionaliseerde form-meaning mappings met verschillende maten van specificiteit. Daarom is bij een UB-gebaseerde aanpak, in tegenstelling tot de meeste traditionele benaderingen van de studie van chunks, het gebruik van woord sequenties die traditioneel niet worden herkend als chunks heel goed mogelijk. Zelfs structureel regelmatige, semantisch samengestelde woordsequenties met of zonder een discourse functie kunnen worden gezien als geconventionaliseerde form-meaning mappings, want ze zijn de manier waarop een bepaalde betekenis bij voorkeur wordt uitgedrukt. Daarnaast is er in UB-benaderingen aandacht voor de dynamische ontwikkeling in tijd van taalgebruik, met name wat betreft variabiliteit: T2-leerders die grotere variabiliteit in hun gebruik van chunks vertonen, ontwikkelen zich na verloop van tijd beter dan leerders die minder variabiliteit vertonen. Tenslotte wordt er in een UB-perspectief van uitgegaan dat form-meaning mappings in de T2 moeten worden ontwikkeld. De verwerving van form-meaning mappings in T2 wordt beïnvloed door form-meaning mappings in de eerste taal en door de frequentie van T2 in de input. Om al deze redenen is een UB-benadering bij uitstek geschikt voor de studie van T2-ontwikkeling.

Uitgaande van een UB-benadering onderzoekt dit proefschrift het gebruik van chunks in geschreven teksten geproduceerd door jonge Nederlandse leerders van het Engels in twee condities, leerlingen met veel en met weinig input in respectievelijk tweetalig en regulier onderwijs. Het hoofddoel was belangrijke aspecten van chunks in de ontwikkeling van T2 Engels te onderzoeken. Het proefschrift bestaat uit vier zelfstandige artikelen in diverse stadia van publicatie, die ingaan op verschillende aspecten van chunks in T2-ontwikkeling

in de geselecteerde leerling populatie. De vier studies zijn gerelateerd, elk ervan bouwt op een bepaalde manier voort op de bevindingen van eerdere.

De eerste studie (Hoofdstuk 3: Smiskova & Verspoor, in press) onderzocht de gevolgen van een grotere blootstelling aan T2-input op de ontwikkeling van chunks in de tijd. Omdat chunks in geschreven teksten moeilijk zijn vast te stellen en er individuele verschillen tussen leerders zijn in het gebruik van chunks, was een bijkomende vraag op welke manier de verschillen tussen hoog en laag gebruik van chunks door leerlingen met veel of weinig input het beste vast te leggen zijn. De studie was cross-sectioneel van opzet en gericht op mogelijke verschillen tussen de twee groepen op twee punten in de tijd: bij het begin van hun respectievelijke programma's (tweetalig of regulier) en 2,5 jaar later. De trends op groepsniveau zijn vervolgens geïllustreerd met twee case studies van de individuele ontwikkeling van twee geselecteerde leerlingen (een leerling met veel input en een met weinig input), waarvan het gebruik van de chunks in de tijd representatief was voor de twee groepen. Uitgaande van een geïntegreerde aanpak van chunks zoals voorgesteld door Granger & Paquot (2008), is een methode ontwikkeld voor de identificatie van eenheden die uit meerdere woorden bestaan in geschreven T2 data. We introduceren ook een aantal andere maten voor chunk gebruik in tekst, waarmee enkele cruciale verschillen tussen leerlingen met veel en weinig input konden worden vastgesteld. In overeenstemming met de UB-benadering waarin input van cruciaal belang is voor een succesvolle T2-ontwikkeling, vonden we dat T2-leerders met veel input meer succesvol waren in hun ontwikkeling van native-achtige chunks dan leerlingen met weinig input. Twee op chunks gebaseerde maten die het beste discrimineerden tussen leerlingen met veel en weinig input waren (a) het aantal soorten chunks per tekst en (b) het percentage chunk-woorden per tekst. Deze maten lieten zien dat leerlingen met veel input een aanzienlijk breder scala aan chunks lieten zien dan leerlingen met weinig input, en dat 46% van de woorden in teksten chunk-woorden waren, wat ook kenmerkend is voor native-speaker taalgebruik. Vanuit een UB perspectief was de belangrijkste bevinding dat er een significant verschil was tussen leerlingen met veel en weinig input in het gebruik van verschillende types chunks, voornamelijk in het type "preferred ways of saying things" (manieren om dingen te zeggen die de voorkeur hebben) zoals *when I grow up* in plaats van *when I am a grown up adult*. Op basis van de bevindingen betoogden we dat leerlingen met veel en weinig input zich wat betreft T2 Engelse chunks anders

ontwikkelen, wat vervolgens wordt weerspiegeld in hun gebruik van T2 Engels: in het algemeen was het gebruik van het Engels van leerlingen met meer input vloeiender en authentieker dan van leerlingen met weinig input. We gaven ook aan dat "favoriete manieren om dingen te zeggen" in meer detail bestudeerd moet worden om drie redenen: (a) ze waren een van de onderscheidende maten bij een vergelijking van leerders met veel en weinig input (b) ze passen niet in traditionele benaderingen van taalstructuur en zijn daarom moeilijk te "vangen" in geschreven T2 data, en (c) ze zijn compatibel met UB-gebaseerd, cognitief-constructivistische taaltheorieën.

De tweede studie (Hoofdstuk 4; Verspoor & Smiskova, 2012) onderzocht de dynamiek van chunk ontwikkeling in de tijd in leerlingen met veel en weinig input, vooral de rol van de variabiliteit in dat proces. Voortbouwend op de resultaten van Studie 1, levert deze studie belangrijke aanvullende inzichten doordat wordt ingezoomd op de dynamiek van de *individuele* ontwikkeling, die vaak worden uitgemiddeld bij het gebruik van traditionele statistiek. De studie was longitudinaal en microgenetisch, gericht op het bijhouden van de ontwikkeling van de chunks in een leerling met veel input en een met weinig input, die waren geselecteerd als representatief voor de twee groepen. We tekenen de ontwikkelings curven van verschillende soorten chunks om te laten zien hoe ze op elkaar inwerken in hun ontwikkeling in de tijd. Vervolgens gebruikten we DST visualisatie- en analysetechnieken (Verspoor, de Bot, & Lowie, 2011) om de ontwikkelingstrajecten van de leerders te analyseren. We vonden dat het traject van de leerling met veel input periodes van verhoogde variabiliteit vertoonde die na verloop van tijd bleken te leiden tot een versmalling van een variabiliteitsbandbreedte. Aan het einde van de studie bleek het gebruik van chunks bij de leerling met veel input gestabiliseerd te zijn op een ontwikkelingsniveau dat hoger lag dan aan het begin van de studie. De leerling met weinig input, aan de andere kant, had minder variabiliteit zonder een versmalling van de bandbreedte. Op de basis van onze analyses gaan we ervan uit dat de variabiliteit van de leerling met veel input betekenisvol is, terwijl de variabiliteit bij de leerling met weinig input meer willekeurig is. Vanuit een dynamisch UB-perspectief, dragen zulke verschillen in variabiliteit bij aan verschillen in chunk ontwikkeling: de betekenisvolle variabiliteit leidt bij de leerling met veel input tot meer succes in de chunk ontwikkeling en dat is niet het geval bij de leerling met weinig input.

De derde studie (Hoofdstuk 5; Smiskova, Verspoor, & Lowie, 2012), was een verdere uitwerking van de bevindingen van de eerste studie, namelijk het significante verschil tussen de twee groepen in het gebruik van "favoriete manieren om dingen te zeggen" en de noodzaak voor verder onderzoek van dit soort eenheden dat uit meerdere woorden bestaat. Aangezien deze uitingen niet gemakkelijk passen in van oudsher gebruikte taal subsystemen (grammatica, lexicon, fraseologie), krijgen ze niet genoeg aandacht in T2 onderzoek. Toch is het fenomeen erkend door een aantal onderzoekers uit verschillende vakgebieden als de combinatie van woorden die duidelijk de voorkeur geniet uit alle manieren die grammaticaal en lexicaal mogelijk zouden zijn om een bepaalde betekenis uit te drukken. We kozen een cognitieve taalkundige aanpak (Langacker, 2008a, 2008b) en beargumenteerden dat "normale manieren om dingen te zeggen" kunnen worden opgevat als geconventionaliseerde form-meaning-functie mappings: "normaal" gedefinieerd als geconventionaliseerd, "manieren om te zeggen" als de vorm , "dingen" zoals concepten of begrippen. We gaven dit verschijnsel de naam “conventionalized ways of saying things” dat werd afgekort als CWOST. We pasten Langacker’s definitie toe in de analyse van geschrevenen teksten van T2-leerders en extraheerden alle mogelijke manieren om een bepaald begrip uit te drukken. Vervolgens gebruikten we twee maten van conventionaliteit, frequentie van voorkomen en native speaker oordelen over natuurlijkheid om ‘gebruikelijke manieren om dingen te zeggen’. We contrasteerden de CWOSTs zoals *when I grow up* met ‘onhandige manieren om dingen te zeggen’ (“awkward ways of saying things” oftewel AWSTs) zoals *when I am a grown up adult* in teksten van T2-leerders. De bevindingen toonden aan dat CWOSTs in principe kunnen worden gedefinieerd als talige eenheden en dat ze een zeer relevant aspect van T2-ontwikkeling zijn en als zodanig moeten worden opgenomen in T2-onderzoek. We hebben echter ook geconcludeerd dat maten van conventionaliteit verdere verfijning behoeven door de complexe relatie tussen de frequentie van voorkomen en conventionaliteit (frequentie als zowel het resultaat en de stuwende kracht achter conventionaliteit), ook, dat om een geconventionaliseerde manier van uitdrukken te kunnen identificeren, het begrip heel zorgvuldig gedefinieerd moet worden.

De vierde studie (Hoofdstuk 6; Smiskova-Gustafsson, ingediend) onderzocht hoe leerlingen T2 chunks als form-meaning mappings vastleggen, met de nadruk op de rol van hun T1 en de rol van frequentie in de T2. Deze studie was

een vervolg op Studie 3 en gericht op de verwerving van CWOSTs. Uitgaande van een cognitief-constructivistisch perspectief, is in deze studie onderzocht of T2-leerders CWOSTs construeren als complete form-meaning mappings zoals L1-gebruikers wordt geacht dat te doen. Omdat T2-leerders al form-meaning mappings in hun T1 hebben geconventionaliseerd, kunnen ze problemen hebben bij het construeren van T2 form-meaning mappings. Hierdoor hebben T2-leerders mogelijk niet de CWOST voor een bepaald concept beschikbaar. Om het concept in hun T2 te uiten, kunnen leerlingen gebruik maken van linguïstische "make-do-oplossingen". De studie in dit hoofdstuk onderzocht hoe Nederlandse T2-leerders van het Engels T2 form-meaning mappings ontwikkelen van voor twee concepten die in chunks worden uitgedrukt: DEPOSITING MONEY, het storten van geld (NP *op de bank zetten*, V Obj $Obl_{path/loc}$) en DONATING MONEY, het doneren van geld (*geef* NP *aan goede doelen*, V Obj Obj2). De bevindingen lieten emergente patronen op verschillende niveaus van de leerling uitingen zien, en verschillende graden van "schematicity" (woorden - slot-frames - VAC's). De emergente patronen geven aan dat de leerders een T2 chunk niet meteen als een semantisch geheel hoeven te behandelen waarvoor er een geconventionaliseerde uitdrukking in de T2 bestaat. Integendeel, ze breken eerst de T1 constructie op in betekenis eenheden (bijv. PROCES, DING, LOCATIE), en vullen die met hun beschikbare middelen uit de T2 om een oplossing te construeren voor ieder deel van de constructie. De studie concludeerde dat, in tegenstelling tot wat er gebeurt in de T1, de constructie van CWOSTs in T2 kan worden gezien als een analytisch, top-down proces, dat sterk wordt beïnvloed door diepgewortelde T1 constructies en beschikbare middelen in de T2.

Ik zie als de belangrijkste bijdrage van dit proefschrift dat het chunk onderzoek theoretisch gefundeerd is binnen een dynamische UB-theorie en uitgaat van een data-gedreven aanpak. Dit helpt bij het identificeren van belangrijke aspecten van chunk ontwikkeling in T2-leerders en draagt bij aan de ontwikkeling van methoden van definiëren en identificeren van chunks. Een UB-gebaseerde theorie maakt het mogelijk om de misschien wel belangrijkste vraag op het gebied van chunks te onderzoeken: wat telt als een chunk in de T2-gegevens in relatie tot native-achtige normen. Ik stel voor dat dit een kwestie kan zijn van het maken van onderscheid tussen geconventionaliseerde manieren om dingen te zeggen (CWOSTs) en onhandige manieren om dingen te zeggen (AWSTs), begrippen die in lijn zijn met cognitief-constructivistische theorieën. De definitie van chunks als geconventionaliseerd T2 form-meaning mappings leidt

tot bepaalde veronderstellingen op basis van een UB-benadering over hoe ze zullen worden verworven door leerlingen van de T2. Dit genereert dan weer onderzoeksvragen die kunnen leiden tot belangrijke inzichten niet alleen in de rol van chunks in T2-ontwikkeling, maar ook in T2-ontwikkeling in het algemeen.

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